WILDLIFE REVIEW

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WILDLIFE REVIEW AND THE PROBLEM OF PRELIMINARY REPORTS

Wildlife Review is devoted primarily to published material. Some mimeographed and processed material is abstracted, but it is seldom feasible to seek out papers that are neither formally published nor generally distributed. Papers of preliminary nature, as indicated by series or content, usually are not abstracted or listed in Wildlife Review.

The recent appearance of several job completion reports in published form makes it desirable to point out that both quarterly reports and job completion reports of PR units are summarized in Pittman-Robertson Quarterly. According to Federal Aid officials, quarterly and job completion reports are to be regarded as administrative documents. Some contain great amounts of raw data on which conclusions concerning regulations are based. Most job completion reports are not publications and do not appear to be. Others are comprehensive bulletins that qualify as publications by almost any standards. There are all gradations between and it is virtually impossible to know which should and which should not be termed publications. Most of these reports have very restricted distribution and are available for only a short time. For these reasons, quarterly and job completion reports must be treated by Wildlife Review as unpublished administrative memoranda. Fortunately, interested readers can consult Pittman-Robertson Quarterly for references to or digests of these reports. When the final report of a project is published, it is, of course, included in Wildlife Review.

Quarterly reports have no status as publications. They are restricted in distribution and their findings are tentative. They are to be classed as statements of progress. It is extremely regrettable that many workers and administrators consider them adequate for presentation of research results. Perhaps more of our work is thus lost than in any other way.

SELECTION OF ENTRIES FOR WILDLIFE REVIEW

Page and cost limitations, as well as time of compiler and readers, make selection necessary. Papers on game, fur, and pest vertebrates (except fishes) are favored over those on other animals. North American work is favored over foreign work solely for practical reasons, not by policy; foreign papers of general interest are included when practicable.

Within fields covered, articles that appear to have significant amounts of original information on management, ecology, natural history, or methodology are entered in the Review. So are good review papers and strong discussions of important topics. Manuals, handbooks, regional surveys of various kinds, and many academic ecological papers are considered valuable tools. Papers on taxonomy, anatomy, and experimental biology are included only if they treat subjects thought to be of interest to a moderate number of wildlife biologists.

Generally excluded are purely popular articles; hunting stories; extension-type papers intended for hunters, farmers, or children; popular compilations of material for which biologists normally would turn elsewhere; papers of local interest having little technical importance; routine harvest reports whose data will be incorporated in annual summaries; brief natural history notes; discussions of administrative problems; routine accounts of development work on particular management areas; and papers on fisheries biology and management. Papers on nongame birds are so numerous that only the larger or more important ones can be listed.

It is evident that selectivity introduces danger of worthwhile articles being omitted. On the other hand, there is very real danger of flooding Wildlife Review with too much borderline material. Effort is made, however, to keep in mind the needs of both research workers and those engaged in operational work in wildlife management.

TYPES OF ENTRIES USED IN WILDLIFE REVIEW

Most readers would like complete abstracts; others require little more than title listing. A flexible middle course is necessitated by circumstances. Some papers can be summarized in a few lines. Others are so extensive that all their subjects cannot be listed. Our usual approach is to tell what topics are treated in a paper and then mention some of the findings. Articles in the more readily available journals may be given less space than those in obscure journals. Listing by title only is used for some papers in fields peripheral to wildlife management, and for some whose titles are exceptionally descriptive of content. We try to make Wildlife Review informative, but it is chiefly a guide to the literature and not a substitute for it; with rare exceptions, entries are not digests of the original works.

WILDLIFE REVIEW

An abstracting service for wildlife management
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Except as indicated, abstracts are by William H. Stickel, editor.

WILDLIFE--BIBLIOGRAPHY, BIOGRAPHY, HISTORY

Anson, Bert. THE FUR TRADERS IN NORTHERN INDIANA, 1796-1850. PhD thesis, Indiana University. 337 p. 1953. [From Dissertation Abstracts 13(5).]

Clepper, Henry. CONSERVATION'S HALL OF FAME. Nature Magazine 46(8): 425-431, illus. Oct. 1953.
Who are the 10 leading conservationists in U. S. history? According to opinions of experts circularized by the author they are, in alphabetical order: Hugh H. Bennett, Jay N. Darling, Ira N. Gabrielson, Aldo Leopold, Stephen T. Mather, John Muir, T. Gilbert Pearson, Gifford Pinchot, Franklin D. Roosevelt, and Theodore Roosevelt. Photographs and brief biographies of each are given. The 10 men who placed 11-20 in the voting are also listed. Selectors are named.

COOPERATIVE WILDLIFE RESEARCH PUBLICATIONS, 1951. U. S. Fish and Wildlife Service. 27 unnumbered p. Duplicator process. No date. [1952.]
Publications of the calendar year 1951 are listed alphabetically by unit and author.

Kauffman, Erle, editor. THE CONSERVATION YEARBOOK: 1953. The Conservation Yearbook, 1740 K Street N. W., Washington 6, D. C. 320 p. 1953. $5.50. [From Journal of Forestry 51(9).]
"...a tool for conservation workers and organizations. It fulfills its mission admirably. This edition is somewhat larger than the first and contains a new section on conservation education. Beside this, as an annual publication, it brings up to date not only its mass of facts and figures but also its listings of the names and addresses of persons directly or indirectly engaged in conservation work, from U. S. Senate committee members to individual consulting foresters and state-employed district foresters."

Leopold, Luna B., editor. ROUND RIVER: FROM THE JOURNALS OF ALDO LEOPOLD. Oxford University Press, N. Y. 173 p., illus. 1953. $3.00. [From review by J. V. K. Wagar, Journal of Forestry 51(12).]
This volume of essays is said to be equal in quality to "Sand County Almanac." Many reviewers have praised it highly. The essays reflect Leopold's life, activities, and interests better than previous works, and constantly reflect his ecological conscience. "The journals range from 1922 to 1937; from hunting and fishing to sheer enjoyment of outdoor living; from the water-threaded aridity of Old Mexico and the Southwest to island-dotted waters of Minnesota and Ontario... The last three essays--'Conservation,' 'Round River,' and 'Goose Music'--tersely summarize all of Leopold's thinking." Illustrations are by Charles W. Schwartz.

Levi, Herbert W. (U. Wis. Ext. Center, Wausau, Wis.) BIBLIOGRAPHY ON INTRODUCTION OF EXOTIC ANIMALS. 1-5 p., mimeo. Revised June 1953.

Shoemaker, Carl D., compiler. DIRECTORY OF ORGANIZATIONS AND OFFICIALS CONCERNED WITH THE PROTECTION OF WILDLIFE AND OTHER NATURAL RESOURCES. National Wildlife Federation (232 Carroll St., N. W., Wash. 12, D. C.). 1-48 p. July 1953. 25¢.
Lists and gives addresses of official and unofficial organizations in the Americas. The more important officers of these organizations are included. Arrangement is chiefly by states. Plans call for annual revision.

Smith, Roger C. (Kans. St. Coll.) GUIDE TO THE LITERATURE OF THE ZOOLOGICAL SCIENCES. Revised ed. Burgess Publishing Co., Minneapolis 15, Minn. viii + 133 p. Sept. 1952. Price not stated.
Everyone admits that students should be well trained in use of literature and bibliographic sources, but all too often little if anything is done about it. Smith's Guide, designed as the basis of a college course, makes it simple to remedy the deficiency if suitable time is alloted. It describes many abstract journals, bibliographies, and other sources; tells how to prepare a bibliography; explains library classification systems; gives information about

WILDLIFE--BIBLIOGRAPHY, BIOGRAPHY, HISTORY--Continued

numerous societies and journals; discusses ways of keeping up with the literature; gives many helpful suggestions on preparing a scientific paper; lists library assignments; and gives much information on related topics. The book has detailed table of contents and index.

Stratton, G. Burder, editor. THE ZOOLOGICAL RECORD, VOLUME 87, BEING THE RECORDS OF ZOOLOGICAL LITERATURE RELATING CHIEFLY TO THE YEAR 1950. Zoological Society of London. vi + 1507 p. 1953. [From Nature 171(4363).]

Comments on the previous volume of this indispensable bibliography appeared in WR 73: 2.

WILDLIFE--EDUCATION

Beuschlein, Muriel, compiler. FREE AND INEXPENSIVE MATERIALS FOR CONSERVATION EDUCATION. National Association of Biology Teachers. 15 p. 1953? 10¢. Order from R. L. Weaver, P. O. Box 2073, Ann Arbor, Mich. 20% discount on orders of 100 or more. [From A.I.B.S. Bulletin 3(5).]

A bibliography prepared as part of the 3-year Conservation Project sponsored by the Association. Materials listed are from private, industrial, and governmental sources. They are chiefly applicable in grades 1-12.

Bronson, Wilfrid S. FREEDOM AND PLENTY: OURS TO SAVE. Harcourt, Brace and Co., N. Y. 124 p., illus. 1953. $2.95. [From review by H. S. Stoeckeler, Journal of Forestry 51(11).]

"It is aimed at the child of grade school level, but has value for teachers and as a text and reference. The subject material covers the entire field of conservation including both renewable and nonrenewable resources--soil, water, forests, game, fish, oil, coal, and metals." One chapter gives practical suggestions to the individual on how he can personally further the conservation program.

Burroughs, R. D. (Mich. Dept. Cons.) HELPS FOR TEACHERS / CONSERVATION COMPENDIUM / A BIBLIOGRAPHY RELATING TO THE WISE USE OF NATURAL RESOURCES. Education Division, Michigan Department of Conservation. 1-40 p. May 1952.

A truly useful guide that recommends a wide range of good books. Entries vary from elementary animal stories to technical references, all classified as being for the teacher or for grades from primary to high school, and as dealing with general conservation, minerals and soils, or plants and animals. Each reference is briefly characterized, so selection is easy. Many of the books listed are true or fictional stories of animals or scientific accounts of animal groups. It would be wonderful for conservation if all students could be exposed to even a fraction of the books recommended.

Dodge, John E. (N. H. Game Dept.) PRELIMINARY REPORT FROM OPINION FINDER DATA. Proc. NE. Section Wildlife Soc., 9th Annual Conf., Bretton Woods, N. H., Sept. 20-23, 1953. 1-10 p.

Results of questionnaire on conservation education and public relations. Most of the 68 replies were from wildlife workers of northeastern states. A few findings follow: Information work requires more support. Good newspaper treatment is worth more expense. Locally produced films are best aid. Radio and T V use should be increased. Biologists should be trained in public relations and writing. Education of children should have priority; teacher training is most imperative need. Sportsmen are not convinced of value of research. College-trained men are lost too fast because of low pay.

Evans, Everett F., editor. CONSERVATION OF SOUTH DAKOTA'S NATURAL RESOURCES. Prepared by Conservation Curriculum Workshop, Northern State Teachers College, Aberdeen, S. Dak. Printed by State Publishing Co., Pierre. vi + 168 p., illus. 1953. Cloth. Price not stated.

A teaching guide and source of much elementary information for those handling conservation instruction in grades 6-8. At first glance one thinks the text is intended for student use, but inspection reveals that it is designed for teachers,

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WILDLIFE--EDUCATION--Continued

consisting of concise statements of facts and principles. Principles are clearly stated, but are not always emphasized. Major sections treat soil, water, plants, wildlife, and minerals. Many demonstrations and class activities are suggested--an important feature. There are also brief lists of selected textbooks, references for teachers, reading references for children, magazines, visual aids, and free and inexpensive materials. In the wildlife section, major groups or species and their adaptations and management needs are discussed. Management ideas presented are modern and progressive. A few minor errors of fact were noted, but the reviewer's chief complaint is that the aesthetic values of wildlife are virtually ignored. In line with this trend, a sharp division seems to be made between beneficial and harmful mammals.

Schwartz, Charles W. (Mo. Cons. Comm.) THE SECOND CONSERVATION SKETCHBOOK. Missouri Conservation Commission. 23 p., illus. 1953. 10¢ in Missouri, 20¢ elsewhere.

Readers of The Missouri Conservationist have long admired the page on which Schwartz treats some biological topic with attractive sketches and brief but accurate text. Here 23 of these pages are bound together to provide a useful educational pamphlet of highly diversified type. Each page takes up a different subject. Some of these are: A Marsh Community, Field Borders, Cave Life, How Long Do They Live?, Self Defense, Locomotion, and Winter Retreats. Few better means have been devised to persuade people of all ages to soak up elementary knowledge of conservation, ecology, and natural history.

WILDLIFE--TECHNIQUES

Anonymous. THE FARMERS REPORT ON GAME. North Dakota Outdoors 16(5): 14-15. Nov. 1953.

Questionnaires on trends in upland game populations were sent to 6,537 selected North Dakota farmers in August 1953. Two-thirds of the farmers replied, and this article gives a digest of the findings, which were in line with those of state biologists. The system will be continued and extended, and a questionnaire will be sent out in February as well as in August. The aim is to get accurate reports from every township in the state.

Crissey, Walter F. (US F&WS.) THE USE OF A DICTATING MACHINE TO RECORD AERIAL OBSERVATIONS. Journal of Wildlife Management 17(4): 539-540, illus. Oct. 1953.

Davis, David E. (Johns Hopkins U.) ANALYSIS OF HOME RANGE FROM RECAPTURE DATA. Journal of Mammalogy 34(3): 352-358. Aug. 1953.

Author's summary: "Analysis of movements and home ranges of vertebrates is difficult for species that can rarely be recaptured or that travel long distances. The usual methods of grid-trapping are inapplicable. Analysis of distances between captures is illustrated by data for 2792 recaptures of Norway rats (Rattus norvegicus) and 159,472 recaptures of Baltimoreans (Homo sapiens). This method has several biological and statistical deficiencies. An improvement is to divide each frequency of recapture by the number of opportunities for recapture at that distance. It is recognized that direct observation may be the only suitable method for some species."

Fant, R. J. (I. C. I. Game Res. Station, Fordingbridge, Eng.) A NEST-RECORDING DEVICE. Journal of Animal Ecology 22(2): 323-327, illus. Nov. 1953.

Automatic electric recorder for study of nesting behavior of wild partridge. "Records obtained from four nesting birds show the periodicity of egg laying, the number and the duration of absences from the nest during the incubating phase, and the bird's reactions to variations in local climatic conditions."

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WILDLIFE--TECHNIQUES--Continued

Garner, Murvel R. (Earlham Coll.) THE PREPARATION OF LATEX CASTS OF SOIL CAVITIES FOR THE STUDY OF TUNNELING ACTIVITIES OF ANIMALS. Science 118(3066): 380-381, illus. Oct. 2, 1953.
Cavities are filled with thinned latex and the cast is dug out 2-3 days later. Relatively fine detail is shown. The method seems more practicable for insect and worm tunnels than for burrows of larger animals, which would require huge amounts of latex.

Kimsey, Alden. (Okla. Game Dept.) THE OKLAHOMA SPORTSMAN'S CLUB MANUAL. Oklahoma Game and Fish Department. 1-15 p. No date. [1953?]
Organization, keeping club active, committees, projects, constitution and by-laws.

Trelease, Sam F. THE SCIENTIFIC PAPER. HOW TO PREPARE IT. HOW TO WRITE IT. A HANDBOOK FOR STUDENTS AND RESEARCH WORKERS IN ALL BRANCHES OF SCIENCE. Williams & Wilkins Co., Baltimore. xii + 163 p. Second ed. 1951. $2.50. [From review by Bentley Glass, Quarterly Review of Biology 28(3).]
"The amount of valuable information in this small volume can only be appreciated by one who has used it. The novice writing his first scientific paper--and just a lot of supposedly mature workers--as well as the inexperienced editor and editorial assistant could spend a few hours going through this book with immense profit. Thereafter it will never be far away."

WILDLIFE--BIOMETRICS

Bateman, B. I. (U. Natal, Pietermaritzburg, Natal, S. Af.) THE POWER OF THE X^2 INDEX OF DISPERSION TEST WHEN NEYMAN'S CONTAGIOUS DISTRIBUTION IS THE ALTERNATIVE HYPOTHESIS. Biometrika 36(1 & 2): 59-63. June 1950.
Example of sampling a plant community.--Vincent Schultz.

Bormann, F. H. (Emory U.) THE STATISTICAL EFFICIENCY OF SAMPLE PLOT SIZE AND SHAPE IN FOREST ECOLOGY. Ecology 34(3): 474-487, illus. July 1953.
"A method is described whereby statistical variance can be used to determine the most favorable size and shape of plot to sample a natural plant population... Statistical variance was further used to determine the number of plots necessary to obtain a sample within definite limits about the true mean of the population." Application of these methods to study of an oak-hickory forest is discussed, and recommendations for sampling are made.

Bourdeau, Philippe F. (Duke U.) A TEST OF RANDOM VERSUS SYSTEMATIC ECOLOGICAL SAMPLING. Ecology 34(3): 499-512, graphs. July 1953.
"Data available from a complete enumeration of an oak-hickory forest stand have been used to compare the values of random and systematic sampling in phytosociology... The following results were obtained: a. On the average, random sampling was only slightly less accurate than systematic sampling. b. Stratification of the random sample always yielded a gain in precision over the unrestricted form, especially in sampling sporadic distributions. c. Low errors of estimates were obtained only for important components of the plant community... It is concluded that stratified random sampling should be used whenever reliable quantitative data are needed on stand composition."

Cochran, William G. SAMPLING TECHNIQUE. Wiley (N.Y.) or Chapman & Hall (London). 330 p., illus. 1953. $6.50. [From review by Marvin Zelen, Science 118(3070).]
Excellent book on sample surveys such as those of Gallup Poll. Well written and by an expert, the volume treats such topics as simple random sampling, stratified sampling, systematic sampling, subsampling, and double sampling. Chapters on ratio and regression estimates are particularly well written. Many good examples are used. Readers who have had a little algebra and one course in statistics can understand most of the material.

WILDLIFE--BIOMETRICS--Continued

Cottam, Grant, J. T. Curtis, and B. Wilde Hale. (U. Wis.) SOME SAMPLING CHARACTERISTICS OF A POPULATION OF RANDOMLY DISPERSED INDIVIDUALS. Ecology 34(4): 741-757, graphs. Oct. 1953.

An artificial population of randomly distributed individuals was studied statistically, as a check on sampling methods. "Perhaps the most important characteristic of a random population demonstrated in this paper is the extreme variability of the results for any of the measures of plant communities studied. This variability is inherent in random populations and its presence necessitates careful planning of sampling procedure...The relation of these findings to actual field practice are discussed, with the general recommendation that larger samples than those generally employed are necessary for satisfactory results."

Craig, C. C. (U. Mich.) ON A METHOD OF ESTIMATING BIOLOGICAL POPULATIONS IN THE FIELD. Biometrika 40(1-2): 216-218. June 1953.--Vincent Schultz.

Craig, C. C. (U. Mich.) ON THE UTILIZATION OF MARKED SPECIMENS IN ESTIMATING POPULATIONS OF FLYING INSECTS. Biometrika 40(1-2): 170-176. June 1953.--Vincent Schultz.

Evans, D. A. (King's Coll., Newcastle upon Tyne.) EXPERIMENTAL EVIDENCE CONCERNING CONTAGIOUS DISTRIBUTIONS IN ECOLOGY. Biometrika 40(1-2): 186-211. June 1953.

"Plant quadrat counts and insect population counts analyzed in this paper..."--Vincent Schultz.

Fujita, Hiroshi, and Syunro Utida. (Kyoto U., Japan.) THE EFFECT OF POPULATION DENSITY ON THE GROWTH OF AN ANIMAL POPULATION. Ecology 34(3): 488-498, graphs. July 1953.

"With the purpose of obtaining a theoretical basis on which existing experimental data on the density effect upon reproduction may be interpreted consistently, a mathematical analysis has been developed from the well-known logistic growth equation." It is shown that formulas developed fit various experimental data quite well.

Goodman, Leo A. SEQUENTIAL SAMPLING TAGGING FOR POPULATION SIZE PROBLEMS. Annals Math. Statistics 24: 56-70. 1953. [Copy of review by C. H. Blake, Bird-Banding 24(4).]

"Samples are drawn from a population and replaced until a predetermined number of marked individuals have been drawn from a part of the population, say the portion banded before the first sampling, whose size is known. No allowance is made for population changes occurring during sampling. It is shown that this procedure is better than drawing a predetermined number of samples. Several accessory matters, such as confidence and fiducial limits, are discussed. Here is the mathematical basis for a useful practical method but the programming is yet to be done."

Kostitzin, V. A. MATHEMATICAL BIOLOGY. George G. Harrap and Co., 182 High Holborn, London W.C.I. Eng. 238 p. 1939. 8s. postpaid.

Of interest to biologists applying mathematics to biological problems. Contents include: Some mathematical ideas; life and environment; growth of a population: the logistic law; population and environment; further mathematical treatment of population growth; relations between species; symbiosis and parasitism; growth of organisms; embryonic growth; postembryonic growth; forms of living objects; and evolution.--Vincent Schultz.

Leslie, P. H., Dennis Chitty, and Helen Chitty. THE ESTIMATION OF POPULATION PARAMETERS FROM DATA OBTAINED BY MEANS OF THE CAPTURE-RECAPTURE METHOD. III. AN EXAMPLE OF THE PRACTICAL APPLICATIONS OF THE METHOD. Biometrika 40(1-2): 137-169. June 1953.

Assumptions basic to the method, namely that sampling is entirely at random and that all classes of marked and unmarked animals are caught with equal facility, are tested with field data. The method proved satisfactory for the

WILDLIFE--BIOMETRICS--Continued

bank vole, Clethrionomys glareolus, but not for the field vole, Microtis agrestis, where marked and unmarked animals responded differently. (See also WR 73:6.)--L. F. Stickel.

Lewis, E. G. (Univ. Coll., Rangoon.) ON THE GENERATION AND GROWTH OF A POPULATION. Sankhya (The Indian Journal of Statistics) 6(Pt. 1): 93-96. 1942.--Vincent Schultz.

Lindner, Milton J. (US F&WS.) ESTIMATION OF GROWTH RATE IN ANIMALS BY MARKING EXPERIMENTS. U. S. Fish and Wildlife Service, Fishery Bulletin 54(78): 65-69, graphs. 10¢ from Superintendent of Documents.

In 1946 Walford published a graphic method of describing growth of known-age animals involving a straight line constructed from measurements taken at constant time intervals. Lindner has extended the method to include animals of unknown age which are marked and recaptured at specified time intervals by plotting length at first capture against length at subsequent captures as a series of straight lines. Relations of lines yields information on rate of growth; point at which lines intersect reveals estimate of ultimate size. The technique is described graphically and mathematically. An example concerns growth of shrimp.--John T. Linehan.

Moran, P. A. P. (Inst. Statistics, U. Oxford, Eng.) THE STATISTICAL ANALYSIS OF THE CANADIAN LYNX CYCLE. I. STRUCTURE AND PREDICTION. Australian Journal of Zoology 1(2): 163-173. 1953.--Vincent Schultz.

Reid, A. T. ON STOCHASTIC PROCESSES IN BIOLOGY. Biometrics 9(3): 275-289. Sept. 1953.--Vincent Schultz.

Slobodkin, L. Basil. (Yale U.) AN ALGEBRA OF POPULATION GROWTH. Ecology 34(3): 513-519. July 1953.

Stevens, W. L. SAMPLES WITH THE SAME NUMBER IN EACH STRATUM. Biometrika 39: 414-417. 1952. [Copy of review by C. H. Blake, Bird-Banding 24(4).]

"The aim is to deduce the total population from a fixed number of samples drawn from each stratum (say county) and the variance in each stratum and for the total population. The most efficient scheme needs two samples from each stratum."

Thomas, Marjorie. (U. College, London, Eng.) SOME TESTS FOR RANDOMNESS IN PLANT POPULATIONS. Biometrika 38(1 & 2): 102-111. June 1951.

"...a discussion of three tests designed to detect departure from randomness in the distribution of a plant species over an area."--Vincent Schultz.

WILDLIFE--ECONOMIC AND OTHER VALUES

Beatty, Richard L. NON-RESIDENT PHEASANT HUNTING AS A SOURCE OF BUSINESS AND REVENUE IN SOUTH DAKOTA. University of South Dakota, School of Business Administration, Business Research Bureau, Bulletin 31. 1-20 p., maps and graphs. June 1953.

Based on 1,400 questionnaire returns. "An estimated $1,749,505 was spent in South Dakota by the 13,335 non-resident pheasant hunters who hunted in the State during the 1952 season. Of this total, $1,442,340 represents additional business in the form of expenditures for goods and services, and $267,165 represents purchases of State licenses and county transportation stamps." A break-down of these sums is given, and various complaints of the hunters are listed.

WILDLIFE--NATURAL AREAS AND REFUGES

Dresser, Cleveland van. WHAT'S HAPPENING TO OUR DUCKS! PART 1. FLORIDA STAGES A COMEBACK. Sports Afield 130(6): 17-21, illus. Dec. 1953.
After years of draining and burning, a flood-control and water-conservation program for southeastern Florida was set up in 1948 by state and federal governments. The project was enormous and many interests competed for lands involved. State and federal wildlife agencies got nearly a million acres for waterfowl and fish management. The state has about 800,000 acres. The U. S. Fish and Wildlife Service has 140,000 acres, the Loxahatchee Refuge. Twenty-five per cent of the refuge will be open to hunting. Dikes are being built to control water levels, sawgrass is being flooded out, and aquatic plants are coming in. Cultivated and other food plants for waterfowl are being farmed on 2,500 acres, with much experimentation. Work is also under way on the vast state tract, which will require more than 150 miles of dikes. These areas are expected to become fine wintering grounds for thousands of waterfowl that otherwise might winter on Carribbean islands and be slaughtered wholesale.

Giles, LeRoy W., David B. Marshall, and Will Barker. STILLWATER WILDLIFE MANAGEMENT AREA. U. S. Fish and Wildlife Service, Conservation in Action, no. 9. 1-9 p., illus. 1953. 15¢ from Superintendent of Documents.
Popular account of a vast waterfowl area being restored by the state of Nevada and the Fish and Wildlife Service, half as refuge and half as hunting ground. Controlled water levels, grazing, muskrats, and other tools will be used as needed to improve the tract for breeding and nesting waterfowl.

Murie, Olaus J. (Moose, Wyo.) WILD COUNTRY AS A NATIONAL ASSET. Living Wilderness 18(45): 1-29, illus. Summer 1953.
With interesting, anecdotal style, one of our leading conservationists discusses the value of natural areas in 3 essays: "I. 'God bless America--and let's save some of it!' II. Wild Country round the world. III. Beauty and the dollar sign."

Sharp, Ward M., and Winston E. Banko. RED ROCK LAKES, A NATIONAL WILDLIFE REFUGE FOR TRUMPETER SWANS. U. S. Fish and Wildlife Service, Conservation in Action, no. 10. 1-9 p., illus. 1953. 15¢ from Superintendent of Documents.
Popular account of this refuge and of habits of the swans.

Smith, McGregor, Jr. WE'RE GIVING IT BACK. Field and Stream 58(7): 40-42, 108-111, illus. Nov. 1953.
Interesting popular account of the vast Loxahatchee Marsh project in Florida and its present and future wildlife. (See also Dresser, Cleveland van.)

WILDLIFE--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION

Gray, James. HOW ANIMALS MOVE. Cambridge Univ. Press, N. Y. xii + 114 p., illus. 1953. $3.00. [From review by James A. Oliver, Animal Kingdom 56(5).]
A leading expert on mechanics of animal locomotion discusses his subject in easily understood terms.

Hess, E. H. COMPARATIVE PSYCHOLOGY. Annual Review of Psychology 4: 239-254. 1953. [From review by M. M. Nice, Bird-Banding 24(3):]
"An expert review of books and papers on animal psychology from May 1951 to May 1952; 71 studies on birds, mammals and insects are described under Orientation, Instinctive Behavior, Learning, and Social Behavior. The author hopes that under the stimulus of 'current European work...comparative psychology will again take its rightful place as one of the foundations on which most psychologies need to be built.'"

Irving, Laurence. PHYSIOLOGICAL ADAPTATION TO COLD IN ARCTIC AND TROPIC ANIMALS. Federation Proceedings 10(2): 543-545. 1951. [From Polar Record 6(46).]
"Temperature, metabolic rate, insulation."

WILDLIFE--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION--Continued

Patterson, Robert L. (Wyo. Game Comm.) WEATHER--KEY TO HUNTING SUCCESS. Wyoming Wild Life 17(11): 16-21, illus. Nov. 1953.
Some effects of weather on production and movements of game.

Spurway, H. CAN WILD ANIMALS BE KEPT IN CAPTIVITY? New Biology 13: 11-30. 1952. [From Journal of Animal Ecology 22(2).]
"Develops the thesis that any species of animal kept in captivity, in zoo, farm, or laboratory, is unavoidably subject to selection favouring departure from the wild type. Thus observations made upon captive animals are not necessarily applicable to populations of the same species but less influenced by man."

Tinbergen, N. SOCIAL BEHAVIOR IN ANIMALS. John Wiley and Sons, 440 4th Ave., N. Y. 16, N. Y. 150 p., illus. 1953. $2.50. [From A.I.B.S. Bulletin 3(5).]
"The author is Lecturer in animal behavior at Oxford University. Concerning this book, he states: 'This book is not intended as an exhaustive review of facts. Its aim is rather the presentation of a new, truly biological approach to the phenomena of social behavior.' It is the approach which makes this book essentially different from other books on social behavior. Following an introduction, there are chapters on mating behavior, family and group life, fighting, analysis of social co-operation, relations between different species, the growth of social organizations, evolutionary aspects of social organization, and some hints for research in animal sociology. The text can be followed by interested non-professionals as well as professionals in the field. The bibliography contains 119 citations."

WILDLIFE--BIOTAS, COMMUNITIES, GENERAL ECOLOGY

Arkansas. A SURVEY OF ARKANSAS GAME. Arkansas Game and Fish Commission, Federal Aid Publication Project 11-R. iv + 155 p., illus. 1951. [1953.]
This bound volume and the large, folded, colored map of game distribution and cover types that accompanies it (though not bound in) are the result of a 1942-46 state wildlife survey. The first part of the report discusses natural regions and cover types of Arkansas. The second and greatest part consists of species or group accounts. The third part is an appendix giving figures on deer and turkey populations, potential deer range, stocking and kill of deer, refuges in state, fur harvests, etc. Species accounts vary in length from 2 lines to many pages. A typical one takes up: Present status, History, Management, Limiting factors, Summary, and Recommendations. Furbearers and larger predators are discussed. The report should serve well as a basis of management and extension work in the state. Workers in other states should find it a good source of data on past and present status of species in Arkansas.

Day, Richard L. (U. Fla.) THE GEOGRAPHIC DISTRIBUTION OF WILDLIFE IN MAINE. Bulletin of the Maine Audubon Society 9(3): 54-62, illus. July 1953.
Discusses the 10 major habitats of Maine: Great Northern Forest, Coastal Coniferous Forest, Brushy and Abandoned Lands, Cities and Towns, etc. Some of the important faunal changes in each are outlined. Changes in status of a number of species of birds, mammals, and fishes are mentioned. A few data are given on reptiles and amphibians. Numbers of vertebrate species in northern and southern Maine are compared. Man has eliminated 16 out of 372 species, but has caused about as many to enter the state. Recovery from severe depletion of wildlife began to appear after 1920. Now about 10% of the species seem to be decreasing, 20% increasing, and 70% remaining constant.

Odum, Eugene P. FUNDAMENTALS OF ECOLOGY. W. B. Saunders, Philadelphia. xii + 384 p., illus. 1953. $6.50.
A college text on general and animal ecology, with emphasis on principles. Complex ecological terminology is used no more than necessary. Complex material is not avoided, but is so explained and illustrated as to make it comprehensible.

WILDLIFE--BIOTAS, COMMUNITIES, GENERAL ECOLOGY--Continued

Sixty per cent of the book is devoted to principles or concepts, with explanations and examples; more than half of this relates to population and community ecology. Thirty per cent of the text discusses habitats: fresh water, marine, and terrestrial. Ten per cent is devoted to a review of ecological applications, including wildlife management, stream pollution, etc. Ideas expressed appear to be sound and progressive. Many of the examples used to illustrate principles are drawn from practical fields, and the author's awareness of conservation problems is apparent throughout. The 13-page bibliography contains a number of 1952 publications. The 119 graphs and photographs are well reproduced.--L. F. Stickel.

Rhode, Clarence J., and Will Barker. (US F&WS.) ALASKA'S FISH AND WILDLIFE. U. S. Fish and Wildlife Service, Circular 17. iv + 60 p., illus. 1953. 25¢ from Superintendent of Documents.

A popular booklet, extensively and attractively illustrated by Bob Hines. It characterizes briefly the major regions of Alaska and discusses at length the natural history, status, and conservation of the more important fishes, mammals and birds. There are also lists of the better known fishes and shell fishes, most of the mammals, all of the birds, all of the trees, and some of the shrubs. Maps show ranges of bears, mountain goat, mountain sheep, moose, caribou, Sitka deer, beaver, muskrat, and 3 fishes.

Storer, John H. THE WEB OF LIFE / A FIRST BOOK OF ECOLOGY. Devin-Adair Co., N. Y. 10, N. Y. 144 p., illus. 1953. $3.00. [From review by Leonard Wickenden, The Land 12(3).]

"...ought to be read by every one...in this country. ...you will be able to read it from cover to cover in a single evening--and that, probably, is exactly what you will do... What is it about? Well, it's about us--all of us--and about the animals and birds and fishes and insects and plants and trees which share this world with us. ...Its pages are packed with facts...always absorbingly interesting and presented with an engaging clarity and simplicity." It explains, for example, the Kaibab fiasco, tells why salmon of the Columbia River are endangered, why man-made deserts exist in Arizona and Tennessee, and why 2/3 of our soil is damaged or destroyed. "If all this sounds dull and dry, blame the reviewer. There isn't a dull or dry page in the whole book..."

WILDLIFE--PARASITES AND DISEASES

Solman, V. E. F. (Can. Wildl. Service, Ottawa.) AN OUTBREAK OF RABIES IN NORTHWEST CANADA, 1951-2. Arctic Circular 5(5): 57. 1952. [From Polar Record 6(46).]

"Aklavik area."

WILDLIFE--MORTALITY FROM INSECTICIDES, WEATHER, CARS, ETC.

Ball, W. L., Kingsley Kay, and J. W. Sinclair. OBSERVATIONS ON TOXICITY OF ALDRIN. 1. GROWTH AND ESTRUS IN RATS. A.M.A. Archives of Industrial Hygiene and Occupational Medicine 7: 292-300. April 1953. [From Public Health Engineering Abstracts 33(7).]

Büttiker, W. J. (J. R. Geigy A. G., Basel.) FLUGZEUGBESTÄUBUNG MIT GESAROL GEGEN DEN MAIKÄFER UND IHRE AUSWIRKUNG AUF DIE VOGELWELT. Die Vögel der Heimat, 18. Jahrgang, Nr. 10/11. 169-178 p. Aug. 1948.

German, with English and French summaries. To control damage by May beetles (June bugs), nearly 100 acres of a Swiss woods were dusted by plane with 4,000 lbs. of 5% DDT dust. Entrance or exit of birds from nest boxes was automatically recorded by electrical device described. Neither DDT nor disturbance by plane had any adverse effect on birds or their broods, whether nests were in boxes or bushes.

WILDLIFE--MORTALITY FROM INSECTICIDES, WEATHER, CARS, ETC.--Continued

Dorsie, R. F., Jr. (Del. Ag. Exp. Sta., Newark.) EFFECTS OF DDT AND LINDANE SPRAYS ON GOLDFISH. Proc. 39th An. Meeting of N. J. Mosquito Extermination Assn. 175-179 p. March 1952.
From author's conclusions: "DDT and lindane insecticides as applied in Delaware [for mosquito control] will kill goldfish on contact. Higher mortalities were recorded in the laboratory tests than in the field test. In general, the older goldfish were less sensitive to poisoning..."

Hoffmann, C. H., and A. T. Drooz. (U. S. Bureau of Entomology and Plant Quarantine, Wash., D. C.) EFFECTS OF C-47 AIRPLANE APPLICATION OF DDT ON FISH-FOOD ORGANISMS IN TWO PENNSYLVANIA WATERSHEDS. American Midland Naturalist 50(1): 172-188, illus. July 1953.

Johnston, Barbara L., and W. G. Eden. (Ala. Polytechnic Inst.) THE TOXICITY OF ALDRIN, DIELDRIN, AND TOXAPHENE TO RABBITS BY SKIN ABSORPTION. Journal of Economic Entomology 46(4): 702-703. Aug. 1953.
Rabbits were immersed in water suspensions of wettable powders. The LD-50 of aldrin was 15-25 mg./kg.; of dieldrin, 400-450 mg./kg.; and of toxaphene, 1025-1075 mg./kg. Symptoms for these insecticides were loss of appetite, extreme nervousness, convulsions, and muscular spasms.--R. T. Mitchell.

Metcalf, C. L., W. P. Flint, and R. L. Metcalf. DESTRUCTIVE AND USEFUL INSECTS: THEIR HABITS AND CONTROL. Third edition. McGraw-Hill Book Co., N. Y. 1071 p. 1951. $10.00. [From long review by J. S. Wade, American Midland Naturalist 49(3).]
This important, standard reference has been thoroughly revised, and modern insecticides are fully discussed.

Popham, W. L. (USDA.) INSECTS, INSECTICIDES AND THE OUTDOORS. Down to Earth (Dow Chem. Co., Midland, Mich.) 9(2): 8-10, illus. Fall 1953.
Chemical control of insect pests is considered basically an emergency measure, but at present is the principal method employed. Entomologists are continually looking for safer cultural or biological means of control, but these have their limitations. Man upset the balance of nature and is now balancing the nature he wants through insecticides.--Paul F. Springer.

Ryckman, Raymond E., Charles T. Ames, and Chester C. Lindt. (School of Tropical and Preventive Medicine, Loma Linda, Calif.) A COMPARISON OF ALDRIN, DIELDRIN, HEPTACHLOR AND DDT FOR CONTROL OF PLAGUE VECTORS ON THE CALIFORNIA GROUND SQUIRREL. Journal of Economic Entomology 46(4): 598-601. Aug. 1953.
Thirty grams of 2.5% aldrin, 2% dieldrin and 2.5% heptachlor dust applied to burrow entrances gave flea control of better than 98% from 3rd to 35th day after treatment. Same amount of 5% DDT gave 58-95% control for same period. Dieldrin was more effective when sprayed at rate of 0.64 gram per burrow. Seven dead squirrels and rabbits were found in area sprayed with 1 lb. per acre of dieldrin. A mechanical and electrical barrier effectively retained and excluded ground squirrels.--R. T. Mitchell.

Springer, Paul F., and Arnold O. Haugen. (Patuxent Refuge, Laurel, Md.) EFFECT OF INSECTICIDES ON WILDLIFE. Presented at the Third Army Annual Insect and Rodent Control Training Conference, Memphis, Tenn., May 5-8, 1953. 1-8 p., mimeo.
Reviews much of the available literature on effects of DDT and other insecticides on mammals, birds, reptiles, amphibians, fishes, insects, other invertebrates, and on soil and plant life. Knowledge of wildlife effects is very meager for most newer materials. Some of these chemicals are more poisonous than DDT, but toxicity varies with animal group. Precautions in use of insecticides are discussed.--P. F. Springer.

WILDLIFE--MANAGEMENT--GENERAL

Allen, Durward L. (US F&WS.) DOES HABITAT IMPROVEMENT WORK? Field and Stream 58(5): 50-51, 95-98, illus. Sept. 1953.
There is plenty of evidence that habitat governs game conditions. Prairie grouse moved into northern Michigan where cutting and fires had created prairie-like conditions, but as areas grew up in brush and trees, ruffed grouse took over. Deer thrive in newly created brush lands. There is no question as to whether habitat improvement works. The question is, how can we make it work? Improvements at a given site must be tailored to the limiting factors at that site. We can spend millions on "habitat improvement" and eventually get nothing but condemnation of the program. "It would be possible to buy millions of shrubs and tons of seed and distribute these to farmers who might or might not know how to plant them in places where they would or would not benefit something important to us. We could say it's a habitat program and therefore we are on the beam. But we could go wrong on it, couldn't we? After a few years of poor results, someone could say: 'We were sold out. The guys who led us into this didn't know what they were doing. Habitat management is no better than the other things we went wrong on.'"

Allen, Durward L. (US F&WS.) OUR WILDLIFE LEGACY. Funk & Wagnalls Co., N. Y. x + 422 p., illus. 1954. $5.00.
What Leopold did for the technician and student in 1933, Allen has now done for the public. His book is one of the finest discussions of wildlife ecology and management problems that has yet been written. It presents facts and basic principles so clearly and forcefully that any serious reader can understand the views of today's ecologically minded management men. The book is based upon and filled with concrete examples. It is so free from technicality and so down to earth that any sportsman or garden club member can understand it all, but is so fundamental that many a technician would do well to study it. Major topics include: relation of wildlife productivity to land fertility; natural increase and turnover of populations; carrying capacity and limiting factors; importance and success of habitat improvement; fluctuations and cycles; need of protecting some species and desirability of heavily cropping others; deer management problems; policies in fish harvesting; pros and cons of introduction of exotics; use and misuse of artificial propagation; effects of planting hatchery fish; predator control--good and bad; bounties; need and value of research and experimentation; wildlife, public pressures, and politics; problems of public lands and natural areas. The volume closes with 36 pages of reference notes, bibliography of 501 titles, and an index. If all sportsmen and administrators would give this book the study it deserves, 90% of our conflicts and misunderstandings would be cleared up and the millenium would be upon us. We can at least recommend it to them.

Callison, Charles. MAN AND WILDLIFE IN MISSOURI. Stackpole Co., Harrisburg, Pa. 134 p. 1953. $1.00. [From review in Outdoor News Bulletin 7(24).]
"...history of one state's treatment of its natural resources. It traces the uses early Missourians made of the state's basic natural resources, its effects on wildlife, and how an aroused citizenry initiated a major conservation reformation. 'In general pattern,' Callison writes, 'the story is typical of America. ...A few states, even today, have hardly advanced beyond where Missouri was...in 1936...' To all persons interested in their state's wildlife resources, this excellent written volume contains two important lessons: wildlife management calls for the application, both in short-range practice and long-range policy, of scientific principles which cannot be achieved in a department whose personnel are limited by the patronage system; and wildlife management can be neither scientific nor efficient if it is shackled by the ridigity of statutory law."

Gabrielson, Ira N. (Wildlife Mgt. Inst.) REPORT ON NORTH DAKOTA GAME AND FISH DEPARTMENT. North Dakota Outdoors 16(3): 4-11, 14-20, 22. Sept. 1953.
Full report of analytical study of organization and functions of the department. Forty-six recommendations are made for improvements. Game organizations of some 20 states have now been surveyed by Gabrielson's team.

WILDLIFE--MANAGEMENT--GENERAL--Continued

Leopold, Aldo. REPORT ON A GAME SURVEY OF ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, MISSISSIPPI, OHIO AND WISCONSIN. Mss. submitted to the Game Restoration Committee, Sporting Arms and Ammunition Manufacturers' Institute, 1928-1930.

These manuscripts contain 65-180 p. in each state report plus unpaged maps, tables and appendices; bound together in 3 volumes and available on loan at the Department of Wildlife Management, University of Wisconsin. The bulk of the material is condensed in the author's Report on a Game Survey of the North Central States. Separate copies for their respective states have been filed in the libraries at Purdue University, Iowa State College, University of Michigan, University of Minnesota, and Ohio State University.--J. J. Hickey.

Leopold, Aldo. IOWA CONSERVATION PLAN. REPORT ON A GAME SURVEY. ix + 126 p. + 30 fig. + 14 tables. Ms. submitted to the Iowa Fish and Game Commission and the State Board of Conservation, September 12, 1932; together with a CONFIDENTIAL REPORT ON LAKE RESTORATION PROJECTS dated April 2, 1932.

Analysis of game conditions underlying the author's Management of Upland Game Birds in Iowa, 1932. In addition to four chapters which appeared in Outdoor America, there are separate chapters on grouse, waterfowl, game mammals, turkeys and the conservation movement in the state. Bound together with some of the author's original maps and notes and available on loan at the Department of Wildlife Management, University of Wisconsin.--J. J. Hickey.

Levi, Herbert W. (U. Wis. Ext. Center, Wausau, Wis.) REPORTS OF INTRODUCTIONS OF ANIMALS / SEPTEMBER 1952 - JUNE 1953. 1-3 p., mimeo. 1953.

Records of introductions of invertebrates, fish, birds, and mammals, chiefly into the U. S. A reference, usually to a state game journal, is given for each record. Species and number released are stated.

Maasen, John H., Jr. (Maine Game Dept.) AN EVALUATION OF PROGRAMS OF LAND ACQUISITION FOR WILDLIFE PURPOSES IN NORTHEASTERN UNITED STATES. Proc. NE. Section Wildlife Soc., 9th Annual Conf., Bretton Woods, N. H., Sept. 20-23, 1953. 1-14 p.

Discussion of values and problems of state purchase or lease of game lands, and results of questionnaire sent to northeastern states. Questionnaire gave data for each state on extent and use of state game lands, plans for acquisition, attitude toward these holdings, taxing and leasing policies. States find that ownership of game lands is useful in management. Open to public hunting, state lands are partial compensation for increased posting. Leasing of hunting rights, as in Pa., can also open large areas. Areas planned for purchase in near future are chiefly marshland and certain lands of low cost.

MacMullan, R. A. (Mich. Dept. Cons.) WHAT PRICE RESEARCH? Michigan Conservation 22(5): 6-9, illus. Sept.-Oct. 1953.

Examples of how wildlife research in Michigan has paid 2,000% return on the investment.

Trippensee, Reuben Edwin. WILDLIFE MANAGEMENT. VOLUME II. FUR BEARERS, WATERFOWL, AND FISH. McGraw-Hill Book Co., N. Y. xii + 572 p., illus. 1953. $7.50.

Like Volume I--on upland game and general principles--this volume is largely a detailed compilation of facts about species and groups of animals. A typical furbearer account (raccoon) treats fur facts, distribution, habits, weights, reproduction, denning, movements, cover requirements, food, population density, censusing, and management. Teachers may wish that important principles, conclusions, and controversial matters were given more emphasis, and that routine data were more often summarized. Material on a subject commonly is presented in the form of separate items of data, rather than as a digest. With its multiplicity of facts and tables, the book seems difficult to use as a text, but it should be extremely handy for quick reference and as a guide to other references. Some papers cited appeared as recently as 1951. Several sections of the book were contributed by

WILDLIFE--MANAGEMENT--GENERAL--Continued

specialists. One of these, the chapter on waterfowl management, is considered out of date by at least one expert because of its emphasis on stable rather than seasonally manipulated water levels. Of doubtful validity are furbearer population estimates made (as on p. 89) by adding number taken by trapper to number assumed to have survived and ignoring the vacuum effect (i.e., influx during trapping). The 5 chapters (179 p.) on fish take up ecology and management of cold- and warm-water sport fisheries in streams, lakes, and farm ponds. Here principles are stressed by writers. These chapters should be valuable to wildlife students who need sound background but not necessarily working knowledge of fisheries biology.

Westerskov, Kaj. (Wildlife Division, Wellington, N. Z.) ACCLIMATIZATION OF NEW GAME SPECIES. New Zealand Department of Internal Affairs, Wildlife Publication no. 17. 1-8 p. No date. [Reprinted from N. Z. Fishing and Shooting Gazette 19(10): 4-8. July 1952.]

Discusses factors that should be considered in introducing species new to an area, with special reference to New Zealand experience and conditions.

WILDLIFE--MANAGEMENT IN FENNOSCANDIA

Anonymous. OFFICIAL GAME RESEARCH IN NORWAY. Papers on Game Research 8: 24. 1952.

The ptarmigan investigations in Norway during the first part of the century are widely known. Since 1932, a research body called "State Game Research Organization" has been operating. It has 3 game biologists and a network of observers (2 inquiries annually). Results of investigations are published in the series "Statens Viltundersøkelser" ("Game Research of the State"), and in various journals. In addition to governmental research, the Norwegian hunters' associations have their own research sections.--Teppo Lampio.

Anonymous. GAME RESEARCH IN SWEDEN. Papers on Game Research 8: 27. 1952.

Organized game research was started in Sweden in 1940 when the Swedish Hunters' League established and financed a research branch. Research is done at the Royal School of Forestry and the experiment station at Öster-Malma. Study of diseases is carried out at the Institute of Veterinary Medicine. Results are published in "Svenska Jägareförbundets Meddelanden" and in various journals. Studies on diseases of game, food of badger, and artificial rearing of game species, to mention a few, have been subjects of research.--Teppo Lampio.

Errington, Paul L. (Iowa St. Coll.) ON SCANDINAVIAN LITERATURE IN WILDLIFE MANAGEMENT AND ECOLOGY. Journal of Wildlife Management 17(4): 393-397. Oct. 1953.

Gives examples of importance of these languages to wildlifers and tells how one can most readily pick up a working knowledge of them by himself.

Holt, Edv. GAME RESEARCH WITHIN THE NORWEGIAN HUNTING AND FISHING LEAGUES. Papers on Game Research 8: 25-26. 1952.

Since establishment of the Norwegian Hunting and Fishing League in 1871, study has been focused on variations in game populations. In 1914, investigations were extended and detailed studies on ecology and diseases of ptarmigan were started. In 1936 the League established a special committee for research and management. It was financed by membership fees and private donations. Results have been presented in the League's journal. In 1950, the League combined with the Laborers' Hunting and Fishing League in a new League of Game Research. It has 2 technical men. The main object has been establishment of a country-wide system of about 1,200 observers. The research agency is not supposed to remain a permanent institution.--Teppo Lampio.

WILDLIFE--MANAGEMENT IN FENNOSCANDIA--Continued

Koskimies, Jukka. TOPICAL HABITAT PROBLEMS OF FOREST WILDLIFE IN FINLAND. Papers on Game Research 8: 36-41, graphs. 1952.

The structure of forests in Finland has been greatly changed by man during the past centuries. Since forest fires have been controlled and burning-over of land for crops stopped, the forests have grown too old to meet the habitat requirements of game. Spruce climax has gained much ground at the expense of deciduous trees. Forests managed for maximum timber yield, less suitable for wildlife, have greatly increased. The quantity of game is highest in younger stands, which are now few. Some forestry practices, however, are beneficial to wildlife: dividing the forest into small stands of different ages, burning logged areas, etc. Increased knowledge and a sound new policy are needed to stop the decreasing trend of game populations.--Teppo Lampio.

Notini, Gösta. TOPICAL GAME PROBLEMS IN SWEDEN (Aktuella viltproblem i Swerige.) Papers on Game Research 8: 35. 1952.

In Swedish. Marked changes in game habitats have taken place in Sweden, as found in the forest surveys. The capercaillie, e. g., has lost 30-55 per cent of its most suitable habitat. Damages by game (especially by moose and roedeer) to young forests and new plantings attract much attention. Conflicts between game management, forestry, and agriculture need investigation. The domestic rabbit, increasing continuously in the wild, creates an additional source of damage.--Teppo Lampio.

Siivonen, Lauri. GAME RESEARCH IN FINLAND. Papers on Game Research 8: 22-24. 1952.

Organized game research in Finland began in 1925 with the establishment of the Game Biology Committee. It dealt only with diseases. The Finnish Game Foundation, established in 1942, has a research institute and 2 research stations. There are 6 full-time and several part-time workers. The foundation has 43 control stations and a network of about 650 observers covering the entire country. Activities of the Foundation are supervised by a governing board consisting of representatives of the Finnish Government and the General Hunters' League. The work is financed by 15 per cent of hunting license funds and by private donations. Main fields of study are: population studies (incl. fluctuations in numbers), habitat problems, food and disease (incl. epidemics), management operations, etc. Characteristic of Finnish research, especially in the beginning, is its concentration on basic problems. Results of studies are published mainly in "Suomen Riista" ("Game of Finland"--in Finnish with English and Swedish abstracts) and in "Papers on Game Research". The Foundation also has a banding program.--Teppo Lampio.

Siivonen, Lauri. THE GAME-GEOGRAPHICAL POSITION AS A BASIS OF GAME RESEARCH AND GAME MANAGEMENT IN FINLAND. Papers on Game Research 8: 27-32, map. 1952.

A schematic map shows the distribution and directions of influence of the three elements of the edible upland game. The main part of the country and the bulk of the upland game (84%) belong to the northern coniferous region, connected with the main part of the region over a wide area in the east. Agricultural game is represented only on a narrow zone in southern and south-western Finland, and is separated from the main region of this game element by the Baltic Sea. This type of game accounts only for 10% of the catch of edible small upland game. As the very northern element makes only 6%, research as well as management of upland game must be centered on game of the coniferous region; this game is well adapted to Finnish conditions. The important fur animals also belong to this game element. Regulation of hunting according to fluctuations in populations is the best management known in these circumstances.--Teppo Lampio.

Spärck, R. SURVEY OF GAME RESEARCH IN DENMARK. Papers on Game Research 8: 20-22. 1952.

Danish game research falls into 3 divisions: Veterinary Department, Department of Food Investigations and Parasitology, and Department of Field

WILDLIFE--MANAGEMENT IN FENNOSCANDIA--Continued

Biology. There is a total of 12 collaborators in the three divisions. The divisions were founded in 1934, 1936 and 1947, respectively. Research is superintended by a committee representing the Ministry of Agriculture, the Game Committee, game organizations and scientific institutions. Expenses are paid by the Game Foundation. Game research actually was started in 1931 with study of diseased game and food of gulls. Results are published in game magazines and in the Danish Review of Game Biology, first published in 1945. Some main topics of study have been: game diseases; parasitological studies, especially on nematodes of gallinaceous birds, and on gapes (Syngamus); foods of game birds, sika deer, and badger; damages by field hare and methods for control; fluctuations in game populations; biology of field hare, etc. Danish research also has a banding program, and is studying artificial rearing of game, importance of cover, and effects of insect and weed control on game.--Teppo Lampio.

Thamdrup, H. M. SOME CURRENT PROBLEMS OF WILDLIFE MANAGEMENT IN DENMARK. Papers on Game Research 8: 32-35. 1952.

The number of licensed sportsmen in Denmark has in recent years slightly exceeded 100,000, i.e., 2½ per cent of the population, and tends to increase. The present aims of wildlife work are to find ways to increase game populations. As more than 75% of the country is agricultural land, the work has to concern farmland game. Additional knowledge of the basic requirements of game is needed. Artificial rearing and stocking of pheasants and partridges has been used widely. Ways to improve the program are to be studied. Possibilities of habitat improvement are also investigated. Attention has been given to insecticides and herbicides. Danish conditions and wildlife problems differ markedly from those in other North-European countries.--Teppo Lampio.

THE CONFERENCE OF THE GAME BIOLOGISTS OF THE NORTHERN COUNTRIES 11-19. V.1952. Papers on Game Research 8: 1-160 p., illus. 1952.

The first conference of North-European game biologists was held in Finland in May, 1952. 26 papers were given at this meeting, where 6 Norwegian, 4 Danish, 3 Swedish and 8 Finnish game biologists were present. The first chapter of the transactions deals with the general schedule of the conference and with the field trips. Other papers are reviewed separately. The conference was followed by the eighth congress of the hunters of the Northern Countries (every fourth year) in Helsinki.--Teppo Lampio.

Westerskov, Kaj. (Wildlife Division, Wellington, N. Z.) WILDLIFE RESEARCH AND MANAGEMENT IN SCANDINAVIA. New Zealand Department of Internal Affairs, Wildlife Publication no. 24. 1-16 p., illus. No date. [Reprinted from New Zealand Science Review 10(9): 136-144, illus. Sept. 1952.]

A brief but impressive review of trends and accomplishments. Given major attention are studies of population fluctuations, census work, game kill statistics, damage control, food habits, disease, and management. In general, trends are similar to those in America, but Scandinavian work on cycles and animal numbers seems to be exceptionally detailed. Eighteen important references are cited.

WILDLIFE--MANAGEMENT--HARVESTS AND HUNTING

Anonymous. WHERE SHALL I HUNT? Washington State, Game Bulletin 5(4): 4-5, 8-9, 12, illus. Oct. 1953.

1953 status of game in Washington, by district and species.--Neil Hotchkiss.

Erickson, Arnold B., and Donald W. Burcalow. (Minn. Div. Game.) MINNESOTA'S GAME KILL. Conservation Volunteer 16(94): 27-37. July-Aug. 1953.

Deer hunting statistics, 1918-52. Kill of small game, including waterfowl and shore birds (by species), 1919-52. Take of fur-bearers (by species), 1930-52.

WILDLIFE--MANAGEMENT--HARVESTS AND HUNTING--Continued

Petrides, George A. (Mich. St. Coll.) LONGER OPEN SEASONS FOR MICHIGAN SMALL GAME AND FUR ANIMALS. Michigan Out-of-Doors 2(10): 12-19, illus. March 1952.

Figures are given showing that cottontails, grouse, squirrels, raccoons, and muskrats should be taken over longer seasons. Surpluses are not being harvested to a proper degree. Slight extension of seasons would do little good, for as a population is reduced, more time is needed to bag an animal. The author also suggests opening the season for bobwhite and dove, which are now protected.

Stuewer, F. W. (Mich. Dept. Cons.) HOW GOOD IS THE "WILLIAMSTON PLAN?" Michigan Conservation 22(5): 23-26, illus. Sept.-Oct. 1953.

Merits and demerits of the Williamston Plan in practice. By 1940 over 120 groups in Michigan were under the plan, but by 1944 the number had fallen to 27. Despite difficulties, the plan has values under certain circumstances and when well handled. It is still a worthwhile method of dealing with the hunter-farmer problem.

WILDLIFE--MANAGEMENT--FARM

Allen, Durward L. (US F&WS.) WILDLIFE HABITAT IN RELATION TO THE USE OF HERBICIDE SPRAYS ON FARMS, RANCHES, AND ROADSIDES. Proc. 43d Convention Internat. Assn. Game, Fish and Cons. Comm'rs. 90-94. 1953.

Discussion of how general use of herbicides is hurting habitat, and how these chemicals can be used beneficially. Several key references are cited. "A part of what we are combating now is the charm of dominating nature easy-like through the magic of modern gadgetry...Once again, operations are far ahead of investigations...It is now beginning to appear that widespread intensive use of the land is so far ahead of our wildlife management knowledge that the verdict is quite likely to be 'too little and too late.' ...it is time now to get busy and develop a basis of workable techniques on which realistic recommendations can be made to those who are doing the job."

Anonymous. PHEASANT FLUSHING BAR. Iowa Conservationist 12(8): 160, illus. Aug. 1953.

Detailed mechanical drawings.

George, Ernest J. TREE AND SHRUB SPECIES FOR THE NORTHERN GREAT PLAINS. U. S. Department of Agriculture Circular 912. 1-46 p., illus. Jan. 1953.

Since 1913 the USDA has been testing hundreds of foreign and domestic woody plants at Mandan, N. Dak. and other places to see how they would do for windbreaks and as ornamentals in dry or irrigated soils. This circular tells how each variety fared, and gives a list of recommended types that shows their characteristics and uses. Possible wildlife values are not mentioned, but some of the species obviously have such value.

Hamilton, K. C., and K. P. Buchholtz. (U. Wis.) USE OF HERBICIDES FOR ESTABLISHING FOOD PATCHES. Journal of Wildlife Management 17(4): 509-516, illus. Oct. 1953.

Plots of corn, sorghum, sunflower, safflower, and buckwheat were treated at or shortly after planting, and no cultivation was given later. Herbicides of which varying concentrations were tested were TCA, CMU, DN, CIPC, and 2,4-D. Results on both crop and weed plants are detailed, and important sources of variation are discussed. CMU, at $3.00 to $6.00 per acre, was the most economical herbicide. "The relatively low cost of treatment with some herbicides, the possible elimination of care after planting and treatment, the moderately high yields of crop plants, and the supplemental weedy growth that occurs in the fall appear to make the use of herbicides a distinct possibility for establishing food patches for upland game birds."

Rosene, Walter, Jr. (US F&WS.) GROWING BICOLOR LESPEDEZA IN SOUTHEASTERN STATES. U. S. Fish and Wildlife Service, Wildlife Leaflet 350. 1-3 p. Nov. 1953.

Sites, soils, fertilizers, planting, maintenance.

WILDLIFE--MANAGEMENT--FOREST AND RANGE

Christisen, Donald M. ACORNS--THE STAFF OF WILDLIFE. Missouri Conservationist 14(10): 10-11, illus. Oct. 1953
Importance to wild turkeys, whitetail deer, squirrels, wild ducks, etc. in Missouri.--Neil Hotchkiss.

Dresser, Cleveland van. HARVESTING TIMBER ON A WILDLIFE REFUGE. American Forests 59(11): 18-19, 91-92, illus. Nov. 1953.
The U. S. Fish and Wildlife Service is harvesting timber on 11 refuges. Operations on the Piedmont Refuge, Georgia, are given chief attention in this article. The area had little if any worthwhile timber in 1939 when it became a refuge. Carefully planned lumbering began in 1944, and in 1952 timber worth $93,000 was harvested. Cuts are made in ways that will benefit game animals, den trees are spared, and certain areas are left inviolate as natural areas. The steady flow of large sawtimber and pulpwood is a boon to local economies; also, 25% of the returns goes to the counties.

Garrison, George A. (U.S. Forest Service, Portland, Ore.) EFFECTS OF CLIPPING ON SOME RANGE SHRUBS. Journal of Range Management 6(5): 309-317, illus. Sept. 1953.
Results of various intensities of clipping current year's growth on game browse plants of eastern Oregon and Washington. Clipping was done in fall and winter. Some clipping stimulated production, but too much injured plant and reduced flowering. Good utilization levels were: antelope bitterbrush, 60-65% on good sites, 50% on poorer sites; snowbrush ceanothus, 35-40%; rubber rabbitbrush, 50%; creambush rockspirea, 50-60%; short plants of curlleaf mountain mahogany, 50-60%.

Hagenstein, W. D. (Industrial Forestry Assn., Portland, Ore.) THE TREE FARM PROGRAM--AN ASSET TO FISH AND GAME MANAGEMENT. Journal of Forestry 51(9): 620-623. Sept. 1953.
Pertains chiefly to the Douglas-fir region of the Northwest. Douglas fir is harvested by clear cutting, but natural succession and replacement of ground cover are rapid because the region is humid. Private and public forest lands are of nearly equal extent in this region. Private lands yield much larger kills of big game because they are more heavily cut, which produces better game range, and because they are more accessible. Kill on private forest land in the region in 1949 was 21,625 deer and 1,154 elk. On national forests of same region, kill in fiscal year 1950 was 3,490 deer and 355 elk. Some owners provide facilities for sportsmen.

Hedrick, D. W., H. H. Biswell, and A. M. Schultz. (U. Calif., Berkeley.) RESPONSE OF BRUSH SEEDLINGS TO SPRAYS OF 2,4-D AND 2,4,5-T ON BURNED CHAMISE AREAS. California Fish and Game 39(4): 497-505. Oct. 1953.
A detailed report. Many seedlings were killed, but enough survived to make a stand of brush. Also, new seedlings appeared the second year after treatment. Higher concentrations of spray were more effective, with best rate of application about 4 lbs. acid per acre. Spraying was more effective in spring than later. "...other means of brush seedling control for game, such as reseeding and grazing management, are more practical and effective than hormone sprays at this time."

Krefting, Laurits W., and Joseph H. Stoeckeler. (US F&WS, St. Paul, Minn.) EFFECT OF SIMULATED SNOWSHOE HARE AND DEER DAMAGE ON PLANTED CONIFERS IN THE LAKE STATES. Journal of Wildlife Management 17(4): 487-494. Oct. 1953.
Conifers of different ages were clipped 1-3 times. Of species tested, red pine was most sensitive to clipping. White pine and jack pine were second and third in sensitivity, while white spruce was the most resistant. Effects varied with age classes. Height losses usually were far greater than survival differences. Form of trees was not affected. "The practical application of the findings is that the older age classes of planting stock, especially the transplant trees, should be used where white-tailed deer and snowshoe hare damage may occur, because they can better withstand browsing. Also browse-tolerant species should be selected where the problem is serious."

WILDLIFE--MANAGEMENT--FOREST AND RANGE--Continued

Peterson, Roald A. (U. S. Forest Service, Missoula, Mont.) COMPARATIVE EFFECT OF SEED TREATMENTS UPON SEEDLING EMERGENCE IN SEVEN BROWSE SPECIES. Ecology 34(4): 778-785, graphs. Oct. 1953.

Studies of seed treatments to find ways of encouraging germination of seeds planted to improve game range and watershed values. Species studied were redosier dogwood, Rocky Mountain maple, antelope bitterbrush, redstem ceanothus, snowbrush ceanothus, Saskatoon serviceberry, and western chokecherry. Results are given by species. "It is suggested that controlled treatment of seed followed by spring planting will likely give higher success than fall planting of untreated seeds."

Webb, William L. (St. U., N. Y.) HARDWOOD PULPWOOD, CHEMICAL DEBARKING, AND FOREST WILDLIFE. Proc. NE. Section Wildlife Soc., 9th Annual Conf., Bretton Woods, N. H., Sept. 20-23, 1953. 1-15 p.

Improvement cuttings for forestry and wildlife have become economically feasible in the Northeast because of 2 innovations. One is production of good pulp from small or inferior hardwoods. The other is chemical debarking. Together, they permit much better land use. Debarking, which is done with sodium arsenite, offers a slight danger to wildlife. Studies on this danger are reported in considerable detail.

WILDLIFE--MANAGEMENT--WET-LAND

Chamberlain, Everett B. A SURVEY OF THE MARSHES OF DELAWARE. Delaware Board of Game and Fish Commissioners. 76 p., illus. June 1951. [1953]

Most of the marshes are tidal, with water varying from entirely fresh to strongly salty. This report correlates salinity with vegetation, and vegetation with the distribution of ducks and muskrats. It describes 18 areas from north to south along the east side of the state, and 3 additional areas in southwestern Delaware, discussing for each its water, vegetation, waterfowl, furbearers, hunters and trappers, and management possibilities.--Neil Hotchkiss.

Griffith, Richard E. (US F&WS.) MOSQUITO CONTROL ON NATIONAL WILDLIFE REFUGES. Proc. 40th An. Meeting of N. J. Mosquito Extermination Assn. 83-84 p. March 1953.

"The Fish and Wildlife Service has and will continue to work in close cooperation with State and local agencies responsible for controlling mosquitoes and other insect pests..." "In the impounding of water on marshlands, the Fish and Wildlife Service has studiously avoided the development of any mosquito habitat, and after looking back over the history of several refuge impoundments, it appears that the water management programs now in effect, by providing habitat for insectivorous fishes and by the physical manipulation of water levels, have served to reduce rather than to maintain the breeding habitat..." Also, control of cattail, which is undesirable on waterfowl marshes, serves to reduce populations of certain dangerous mosquitoes.

MacNamara, L. G. (N. J. Dept. Cons.) NEEDS FOR ADDITIONAL RESEARCH ON MOSQUITO CONTROL FROM THE STANDPOINT OF FISH AND GAME MANAGEMENT. Proc. 39th An. Meeting of N. J. Mosquito Extermination Assn. 111-116 p. March 1952.

Natural salt marshes in New Jersey produce many ducks, rails, and muskrats. Much of their value is lost when they are ditched for mosquito control. One good solution is impoundments that are drawn down during warm season. Annual duck foods grow in the basins and mosquito production is slight. Waterfowl and muskrats thrive. Another technique is to produce pools in mosquito-breeding marshes. In future mosquito control, attention should be given to methods of controlling water level that will favor all interests, to preservation or deepening of existing ponds, and to wise use of insecticides and herbicides.

WILDLIFE--MANAGEMENT--WET-LAND--Continued

MacNamara, L. G. (N. J. Dept. Cons.) THE PRODUCTION AND CONSERVATION OF WILDLIFE IN RELATION TO MOSQUITO CONTROL ON STATE OWNED LANDS IN NEW JERSEY. Proc. 40th An. Meeting of N. J. Mosquito Extermination Assn. 74-77 p. March 1953.

Work of the past year has further substantiated the wildlife and mosquito-control values of impoundments operated by warm season draw-down. These impoundments have also produced a fresh water fishery. Maintenance costs have been very low. Mosquitoes are not produced in all parts of a natural marsh; sometimes natural ponds or artificial pot holes having large fish populations are enough to solve a local mosquito problem. Discussion following the paper brought out the point of view that when a public agency takes over an area (as for wildlife purposes), the agency has a responsibility to see that mosquito control is at least as efficient as before; and that this responsibility should be faced before the area is acquired.

Soil Conservation Society of America. REPORT OF COMMITTEE ON WETLAND MANAGEMENT. Journal of Soil and Water Conservation 8(6): 275-278, 281. Nov. 1953.

Good discussion of agricultural drainage vs. wildlife. The committee recommends that state wildlife agencies be informed of proposed drainage, and that where valuable wildlife habitat is involved, the landowner be encouraged to keep and manage the area for wildlife or to turn it over to others for such management.

WILDLIFE--MANAGEMENT--PREDATION, CROP DAMAGE, AND CONTROL

Leach, Howard R., and Walter H. Frazier. (Calif. Dept. Game.) A STUDY ON THE POSSIBLE EXTENT OF PREDATION ON HEAVY CONCENTRATIONS OF VALLEY QUAIL WITH SPECIAL REFERENCE TO THE BOBCAT. California Fish and Game 39(4): 527-538, illus. Oct. 1953.

Report on stomach analyses of 55 bobcats, 19 coyotes, 2 gray foxes, 4 kit foxes, 9 striped skunks, 1 spotted skunk, and 5 badgers, all taken in areas of quail concentration. The study showed that adult quail are minor prey species, and that control of mammalian predators is of doubtful value even in quail concentration areas. Effect of these predators on nesting success was not determined.

Vos, A. de. (Ontario Dept. Lands & Forests.) ARE BOUNTIES NECESSARY? Michigan Out-of-Doors 3(5): 30-33, illus. Oct. 1952.

Cites examples to show that bounties are bad business, and discusses the Ontario wolf bounty, which some people wish raised from $25 to $50. Wolves have not prevented great increase and spread of deer. The bounty has not reduced wolf populations. An annual take of 1000-1500 wolves is a drop in the bucket; a kill of 30,000 would be necessary to cut the population. This would cost at least $750,000 a year.

WILDLIFE--REPORTS OF ORGANIZATIONS

Alberta. ANNUAL REPORT OF THE DEPARTMENT OF LANDS AND FORESTS OF THE PROVINCE OF ALBERTA FOR THE FISCAL YEAR ENDED MARCH 31ST 1953. Edmonton, A. Shnitka, King's printer. 1-100 p., graphs. 1953.

Report of the Fish and Game Commissioner (53-64 p.) includes review of game conditions, brief account of campaign against rabies, figures on wolves and cougars bountied, and table (by species) of fur-bearers caught. Season on moose was opened after 2-year closure; hunters concentrated on this species and drain on population was extremely high. Cyclic crash of upland game birds was thought to have begun, though spottily. The campaign against crows and magpies was pressed as before, but it became evident that although the populations fluctuated, no real population reduction had been achieved. When rabies broke out in northern Alberta in 1952, 170 trappers were employed and armed with all possible devices. A double trapline of 5,000 miles was set up "on the edge of the forested area completely surrounding the settled area of the Province."

WILDLIFE--REPORTS OF ORGANIZATIONS--Continued

ASSOCIATION OF MIDWEST FISH AND GAME COMMISSIONERS, PROCEEDINGS OF 19TH ANNUAL MEETING, Des Moines, Iowa, Aug. 15 & 16, 1952. 1-122 p. 1953?
Leading game administrators discuss many problems: policies in waterfowl management, relations with U. S. Forest Service, recruitment and functions of conservation officers (wardens), conservation education methods, place of research in conservation, relations with organized sportsmen, and other matters. One of the resolutions passed was in opposition to bounties. These Proceedings should be of real value to those concerned with the problems of the times and the views experienced administrators take of them.

British Columbia. PROVINCIAL GAME COMMISSION REPORT FOR THE YEAR ENDED DECEMBER 31st 1952. Dept. of Attorney-General, Victoria, B. C. 1-90 p. 1953.
Contains much interesting material on game and predator conditions in different regions of the Province. Tables show (by species) numbers of fur-bearers harvested, 1921-52; numbers of injurious animals killed, 1951 and 1952; and numbers of animals bountied, 1922-52. As a result of moose overpopulations and starvation of long standing, a 6-day season on cow moose was allowed in certain areas. About 800 cows were killed. Chukar partridges were introduced into areas thought to be suitable. Peak of the grouse cycle seemed to have been reached and the trend was downward, with local variation. In areas of high hunting pressure, deer have become exceptionally wary, almost nocturnal. Pheasant stocking proved of doubtful value, with only 31-34% of banded game-farm birds bagged, and these comprising only 5% of the pheasant kill. Predator control was considerably increased, chiefly by poison, and will be further increased. A 3-year small-mammal study revealed no effect of coyote removal on small-mammal populations. Several kinds of fur-bearers were increasing because low pelt prices led to light trapping.

Florida. BIENNIAL REPORT OF THE FLORIDA GAME AND FRESH WATER FISH COMMISSION FOR THE PERIOD ENDING DECEMBER 31, 1952. Tallahassee. 1-45 p., illus. 1953.
Interesting, general report on work and plans of divisions and districts. In the last five years, public hunting land controlled by the Commission increased from 213,700 acres to more than 1,700,000 acres, although most of it remained in private ownership. Major plans for the future are: 1. Extension of law enforcement facilities. 2. Extension and management of public hunting and fishing areas. 3. Water hyacinth control.

Handley, Rolland B. (Miss. Game Comm.) FEDERAL AID IN FISH AND WILDLIFE RESTORATION. Mississippi Game and Fish 17(3): 3-7,10, illus. Oct. 1953.
This report on PR work in Mississippi gives considerable information on: acquisition and development of refuges and management areas; restocking of deer; results of squirrel study (data for 1949-52 on total kill, hunting statistics, reproductive condition of females shot; recommendation for reduced bag of fox squirrels); review of deer project; data on mink harvest and pelt prices in recent years.

Iowa. REPORT OF THE STATE CONSERVATION COMMISSION FOR THE BIENNIUM ENDING JUNE 30, 1952. 1-210 p., illus. 1953.
Report of the Division of Fish and Game (61-106 p.) includes: nature and progress of game management area program and farmer-sportsman's cooperative program; report on quail and pheasant stocking (minimal); brief statements of status of game and fur animals; short accounts of land acquisition and development under PR; and summaries of studies of the Biology Section. The latter tell how trend and index data are obtained and give results for recent years in terms of population changes, hunting statistics, and age and sex ratios. These results are stated in considerable detail for pheasant, quail, raccoon, beaver, squirrel, rabbit, and waterfowl, and in brief for deer, muskrat, mink, skunk, and foxes.

WILDLIFE--REPORTS OF ORGANIZATIONS--Continued

KANSAS FORESTRY, FISH AND GAME COMMISSION, FOURTEENTH BIENNIAL REPORT, JUNE 30, 1952. Pratt, Kans. 1-74 p., illus. [1953?]
Survey of organization, activities, and finances. Includes general information on: status of quail, pheasant, and prairie chicken; propagation of quail and pheasants; development of Cheyenne Bottoms and Marais des Cynes waterfowl areas; and progress of cover restoration program.

Maryland. THIRTY-SIXTH ANNUAL REPORT OF THE DIRECTOR AND THE FIFTEENTH ANNUAL REPORT OF THE GAME AND INLAND FISH COMMISSION 1953. Maryland Conservationist 30(3): 4-24, illus. Fall 1953.
Account of activities, with statistical tables. Management and development projects are briefly described.

Massachusetts. EIGHTY-EIGHTH ANNUAL REPORT, DIVISION OF FISHERIES AND GAME. 55 p., graphs. Mimeo. 1953.
Good picture of activities and policies. Treatment includes: game propagation, accounts of work in management districts, grouse wing and tail study, PR projects and their results, and projects of the Cooperative Research Unit. The Division is financially healthy, with surplus of $571,999. Fish hatchery and game farm production is being increased. 66,000 pheasants were produced during the year at total cost of $2.15 per bird. This stocking, however, did not promote breeding in the wild as anticipated. 1875 snowshoe hares were purchased from New Brunswick at cost of $4.00 per hare, and this stocking is to be increased. The trend is away from research and surveys and toward more management. An I. & E. section has just been set up. The Division has been given power to set season and bag limits.

Nevada. REPORT OF THE FISH AND GAME COMMISSION FOR THE PERIOD JULY 1, 1950, TO JUNE 30, 1952, INCLUSIVE. 1-47 p. 1953.
Includes descriptions of Federal Aid projects, work of district agents, beaver conservation (beaver protected as much as possible for value in water storage), and study of fate of game farm pheasants. In this study, 1,207 banded cocks were released in a favorable experimental area. Returns of banded pheasants were only 32.5%, varying from 15.5% for younger birds to 66.4% for older birds freed just before season. Kill of wild birds was so great that released birds were only 27.3% of bag. In other areas, success on banded game farm birds averaged 25.7%. Each game farm bird bagged cost state about $8.00. (Neighboring state found cost per bird was $18.00.) On strength of these findings, the Nevada game farm was closed.

New Mexico. ANNUAL REPORT, DEPARTMENT OF GAME AND FISH, JULY 1, 1952 TO JUNE 30, 1953. 20 unnumbered p., illus. 1953.
Includes: review of game conditions, data on game farming and transplanting, notes on several PR projects, and figures on beaver control.

New York. CONSERVATION DEPARTMENT, 41ST ANNUAL REPORT, FOR THE YEAR 1951. Legislative Document (1952) no. 78. 1-338 p., illus. 1952.
Information on game work is chiefly on pages 194-218. Includes: work of game management districts; descriptions of PR projects and some of their results; report of game food and cover nursery; account of rabies control program (fox trapping in zones around areas of infection); results of beaver, otter, and fisher trapping seasons; tabulation (by counties) of 1951 deer harvest; and figures on game breeding (being curtailed).

PROCEEDINGS OF THE FORTY-THIRD CONVENTION OF THE INTERNATIONAL ASSOCIATION OF GAME, FISH AND CONSERVATION COMMISSIONERS, Sept. 14 & 15, 1953, Milwaukee, Wis. 1-194 p. 1953. $2.00 from Int. Assn. G., F. & Cons. Comm'rs., State Capitol, St. Paul 1, Minn.
Publications of this sort contain much information of general interest and are worthy of more attention than they generally receive. Here we find the latest thoughts of top game administrators and their official committees on such topics as national land and water use policy, hunting in national parks,

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study of personnel standards, wildlife conservation planning, federal legislation affecting conservation, introduction of exotic animals, the waterfowl situation and the flyway councils, how to increase wildlife on private lands, managing habitat with herbicides, policy and administrative problems on the state level, in-service and recruit training programs, model state legislation for administration of renewable resources, relationship between research and administration, operating agreements with federal agencies, proposed changes in Federal Aid Act, state's rights in controlling interior rivers, report of new director of Fish and Wildlife Service, and international cooperation on conservation treaties and projects.

Van Deusen, R. D. MARYLAND'S NATURAL RESOURCES INVENTORY; THREE YEAR PROGRESS REPORT. Department of Research and Education (Solomon's Island, Md.), Educational Series no. 32. 1-28 p., illus. Jan. 1953.
The inventory covers waters, forests, fish and game, with one man working in each of these fields. Game projects whose aims and results are briefly described are: 1. Annual statewide game kill study. 2. Game population studies on typical farms in Maryland. 3. Statewide wildlife habitat survey. 4. Animal [vertebrates other than fishes] distribution in Maryland. 5. Annual study of the composition and condition of the game species. 6. The ecology of the gray squirrel.

Virginia. ANNUAL REPORT OF THE COMMISSION OF GAME AND INLAND FISHERIES FOR THE FISCAL YEAR ENDING JUNE 30, 1951. Richmond. 16 p. 1953.
Financial accounting only.

Virginia. ANNUAL REPORT OF THE COMMISSION OF GAME AND INLAND FISHERIES FOR THE FISCAL YEAR ENDING JUNE 30, 1952. Richmond. 16 p. 1953. [From Monthly Checklist of State Publications 44(8).]

West Virginia. ANNUAL REPORT OF THE CONSERVATION COMMISSION. West Virginia Conservation 17(8): 1-48 p., illus. Oct. 1953.
Report on game management (34-43 p.) summarizes information on: the cooperative farm game management program, management on national forests and special areas, restocking, game population trends, and the gray squirrel investigation. Stocking of chukars was terminated, with no evidence of establishment. The game farm was closed. Much habitat improvement was practiced on farms, forests, and special management areas. A total of 320 beavers was trapped. 1,705 foxes were bountied. The deer problem and the 1952 kill are discussed, and the kill is tabulated. In 2 years of hunter's choice seasons, more deer were killed than in the 22 years of buck seasons for which records exist, yet the herd was not hurt. Total deer kill in 1952 was 17,140. Kill of bear was 69, of turkeys 436. Time-area counts of gray squirrels on a study area indicated population of 43 per 100 acres. Only 14% were taken during the 8-day season. Mast index for state was close to the average of the last 9 years.

MAMMALS--GENERAL

Bourlière, François. THE NATURAL HISTORY OF MAMMALS. Alfred A. Knopf, N. Y. xxi + 363 + xi p., illus. 1954. $5.00. (In Canada, McClelland & Stewart, Ltd.)
This French publication of 1951 has been revised and brought up to date for the American edition. Despite the modest title it is a thoroughly modern, interestingly written review of mammalian biology from the ecological viewpoint. Its value to American workers is enhanced by comparative discussions and numerous illustrative examples from the world literature. Emphasis is on principles, problems, and examples, yet the cut-and-dried approach of textbooks is avoided. There are chapters on such subjects of current interest as territory and home range, migrations, social life, relation to environment, and population dynamics, as well as on locomotion, food habits, defense, reproduction, development, and longevity. It is gratifying to find these topics discussed

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for mammals of the world. Although the author does not attempt to treat any subject exhaustively, the book is a valuable introduction to field mammalogy and is good reading for anyone interested in animals. There is a classified bibliography of 26 pages.--L. F. Stickel.

Gudger, E. W. (Amer. Mus. Nat. Hist., N. Y.) ON CERTAIN SMALL TERRESTRIAL MAMMALS THAT ARE ALLEGED TO FISH WITH THE TAIL. American Midland Naturalist 50(1): 189-201, illus. July 1953.

Compilation of ancient and recent accounts of jaguar, house cat, fox, otter, rat, raccoon, and coyote using the tail in fishing. In general, the tail is said to be held in water until crustaceans (and possibly small fishes) attach to it or hid among its hairs. Another technique, reported for felids, is to dabble the tail tip into water and then claw out fish attracted by the disturbance.

Koskimies, Jukka. A METHOD FOR ANALYSING THE WINTER HABITAT PREFERENCES OF FOREST MAMMALS. Papers on Game Research 8: 58-63. 1952.

The Finnish classification of forests is based on biological criteria (species composition, age, density, fertility, etc.) A method for quantitative measurement of habitat preferences in the snow hare (L. timidus) based on this classification is described. In the field work two methods have been used: 1. The position of hare tracks crossing the transect lines of a grid system have been recorded on a forest map. 2. The routes traveled by different hares are reproduced on the forest map and analyzed there with a (theoretical) grid of transect lines, as in method 1. The comparison between the habitat used and that available is based on the number of track-transect intersections per unit of line, or on the length of hare track per area unit of each forest type.--Teppo Lampio.

Laws, R. M. A NEW METHOD OF AGE DETERMINATION IN MAMMALS WITH SPECIAL REFERENCE TO THE ELEPHANT SEAL (MIROUNGA LEONINA, LINN.). Falkland Islands Dependencies Survey, Sci. Repts. no. 2: 1-11, 1 plate. 1953. (London: Her Majesty's Stationery Off., 3 s. net).

From author's summary: "Growth layers occurring in the teeth...are described, and the validity of these layers as indicators of age discussed. Similar growth zones occur in the teeth of all other pinnipeds which have been examined. A brief survey of material in museums suggests that these annual growth layers are not confined to the pinnipeds, nor to aquatic animals only, and that they also occur in reptiles.--V. B. Scheffer.

Llewellyn, Leonard M. (Patuxent Refuge, Laurel, Md.) TIPS ON TRAPPING, TAGGING, AND HANDLING SMALL GAME AND FUR ANIMALS. Proc. NE. Section Wildlife Soc., 9th Annual Conf., Bretton Woods, N. H., Sept. 20-23, 1953. 1-27 p., illus.

Suggests suitable traps, baits, handling methods, anesthesia techniques. Tells how to select and apply tags, how to keep records. Techniques for different species are tabulated. Bill of materials and diagram for commonly used box trap are given. Much information is supplied on tags--their types, sizes, prices and availability. A toe-clipping system is illustrated. Forty-three references.

Martin, Alexander C. (Patuxent Refuge, Laurel, Md.) SMALL ONLY IN SIZE. Sports Afield 130(3): 25-31, illus. Sept. 1953.

Well illustrated in color by Bob Hines, this article gives average and high or maximum weights for most of our small game and fur mammals. It also discusses briefly the importance of soils and foods in determining animal weight and condition.

Moore, Clifford B. WAYS OF MAMMALS / IN FACT AND FANCY. Ronald Press, N. Y. xi + 273 p. 1953. $3.50.

A fascinating and useful book, a first resort for harassed workers who must answer inquiries from the public on all manner of subjects. It is

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devoted entirely to expounding and exploding legends and misunderstandings about mammals. The book is simple and can be read in snatches quite easily. It is well documented and several sections are by such specialists as John Eric Hill, Carl G. Hartman, Glover M. Allen, and Frank A. Beach. The reviewer learned of many facts and fancies new to him in scanning this book and suspects that others will too. Myths and mistakes that the authors explore range in date from ancient days to 1952. Among the scores of topics treated are elephant graveyards; elephant memory; superstitions about horses and cats; bats as navigators and as medicine; vampire beliefs; measuring trees, ferocity, and dormancy of bears; supernatural attributes of dogs; cats sucking the breath of babies; odd ideas about beavers; woodchuck hibernation; egg-carrying rats; waltzing mice; mermaids and manatees; man, monkeys, and religion; seeing in the dark; weather prophets; "hypnotizing" animals; children reared by wild mammals; and mammalian freaks.

Stullken, Donald E., and William A. Hiestand. (Purdue U.) AN EXPERIMENTAL STUDY OF THE INFLUENCE OF PELAGE PIGMENTATION ON METABOLIC RATE AND ITS POSSIBLE RELATIONSHIP TO BODY TEMPERATURE CONTROL AND ECOLOGICAL DISTRIBUTION. Ecology 34(3): 610-613, graph. July 1953.

Black mice, and white mice dyed black, were compared with white mice in respect to oxygen consumption over a wide range of temperatures. Black mice, especially dyed ones, had more trouble with temperature regulation at low temperatures than did white ones, using much more oxygen. White color may be an advantage to arctic animals in heat control.

MAMMALS--FAUNAS AND MANUALS

Gunderson, Harvey L., and James R. Beer. THE MAMMALS OF MINNESOTA. University of Minnesota Press. Minnesota Museum of Natural History, Occasional Papers no. 6. xii + 190, illus. 1953. $3.50, cloth; $2.00, paper.

An attractive, semitechnical book that fills a need formerly met by the work of Swanson, Surber, and Roberts, now out of print. Identification is by fairly simple keys, aided by glossary and drawings. Lengthy descriptions are wisely omitted, but measurements and recognition characters are included. Excellent photographs, chiefly by Tom McHugh, add much to the volume. Subspecies are not treated, except in Peromyscus. General and in-state ranges are mapped. Natural history of each species is briefly discussed, usually with comments on status and ecology. Introductory sections describe the collection, preparation, and field study of mammals, and the geography of Minnesota. In a state handbook, more information on biology, ecology, and conservation of the species would have been welcome. This could have been included without lengthening the volume by better utilization of the map pages, as demonstrated in the companion volume on reptiles and amphibians.

Lancum, F. Howard. WILD MAMMALS AND THE LAND. London, Her Majesty's Stationery Office. Ministry of Agriculture and Fisheries Bulletin no. 150. 1-60 p., illus. 1951. 2s. 6d.

An attractive, popular booklet on the mammals of Britain. It can be read for sheer pleasure. The excellent black and white photographs alone are worth the price. Emphasis of the text is on economic relation to agriculture, but much natural history is included, especially for important or controversial species. Some species (deer, wild cat, bats) are not treated and a few others are given little space. The paper closes with a table showing relative frequency of use of various plant and animal foods by the more important rodents and predators. The extent to which the American gray squirrel has become a pest in Britain, and the detestation it has earned there are nearly incredible. It is rated little above the rat.

MAMMALS--FAUNAS AND MANUALS--Continued

Rausch, Robert. (Arctic Health Res. Center, Anchorage, Alaska.) ON THE LAND MAMMALS OF ST. LAWRENCE ISLAND, ALASKA. Murrelet 34(2): 18-26. May-Aug. 1953.
Chiefly a discussion of taxonomy, relationships, and abundance of mammals of this island near Siberia. Many data are given on measurements of Alopex lagopus, Citellus undulatus, and Microtus oeconomus. The author stresses subspecific relationship with Asiatic forms. Sorex jacksoni is considered a race of S. tundrensis. Arctic foxes are discussed at length, with the conclusion that several named forms are invalid, and "that a single highly variable form of arctic fox has circumpolar distribution." Taxonomic discussions are also given for Dicrostonyx torquatus exsul and Clethrionomys rutilus albiventer.

Rausch, Robert. (Arctic Health Res. Center, Anchorage, Alaska.) ON THE STATUS OF SOME ARCTIC MAMMALS. Arctic 6(2): 91-148, illus. July 1953.
Much taxonomic and some ecological information on Alaskan mammals, especially those of the Brooks Range. Emphasis is placed on relationships with Old World forms as determined by the author and others, particularly British and Russian workers. As a result, several American species are considered merely subspecies of Old World species. All brown and grizzly bears are termed Ursus arctos, with the only races recognized being horribilis, gyas, and middendorffi. Variation in these bears is discussed at length. Other changes of species names are: Vulpes vulpes for V. fulva. Gulo gulo for G. luscus. Felis lynx for Lynx canadensis. Lepus timidus for L. othus. Marmota marmota for M. caligata. Citellus undulatus for C. parryi. Lemmus sibiricus for L. trimucronatus. Dicrostonyx torquatus for D. groenlandicus. Rangifer tarandus for R. arcticus. Ovis canadensis for O. dalli and O. nivicola (latter of Kamchatka). Revisionary treatment of Alaskan races is given for Marmota, Citellus, Microtus oeconomus and M. miurus. Habits and relationships of M. miurus are discussed. Validity of certain wolf races is questioned. Wisdom of wolf control is questioned because populations fluctuate anyway and because control of high population of 1951-52 probably lessened effect on wolves of rabies and distemper epizootics that were present and common in other hosts. Caribou of northern Alaska are thought to be increasing, perhaps too much for their range, and are known to be suffering from hoof disease. The author believes that if wolves were not controlled they would thin out caribou lame from hoof disease, and would keep caribou moving from infected areas. He also believes natives have real need of a higher legal take of caribou. Herds, movements, and population trends of Arctic Slope caribou are discussed.

Seton, Ernest Thompson. LIVES OF GAME ANIMALS. Charles T. Branford Co., Boston 16, Mass. 8 vols. Reprinted 1953. $50.00.
This reissue of an important, encyclopedic, yet entertaining set is printed from the original plates and has 1500 illustrations. Even today Seton's work has much value. Many institutions and individuals should welcome the chance to obtain it now that it is back in print. Certainly no library of wildlife or natural history literature should be without it.

MAMMALS--CONTROL, MORTALITY

Herrick, E. H. CONTROL OF MAMMALS INJURIOUS TO AGRICULTURE IN KANSAS. Agricultural Experiment Station (Manhattan), Circular 296. 18 p., illus. 1953. [From Monthly Checklist of State Publications 44(8).]

MAMMALS--SHREWS, MOLES, BATS

Christian, John J. (Naval Med. Res. Inst., Bethesda, Md.) THE NATURAL HISTORY OF A SUMMER AGGREGATION OF EPTESICUS FUSCUS FUSCUS. Naval Medical Research Institute, Memorandum Report 53-16. 161-193 p., illus. Aug. 1953.
Important, technical, quantitative study of reproductive cycle, and of exact age determination by use of canine wear and annular rings of dentin. Number of young is discussed critically. Data are given on adrenal gland changes, growth of young, and juvenile mortality. [Reprints available from author. The paper is expected to appear later in the American Midland Naturalist.]

MAMMALS--SHREWS, MOLES, BATS--Continued

Griffin, Donald R. (Harvard U.) BAT SOUNDS UNDER NATURAL CONDITIONS, WITH EVIDENCE FOR ECHOLOCATION OF INSECT PREY. Journal of Experimental Zoology 123(3): 435-465, illus. Aug. 1953.

Schwartz, Charles and Elizabeth. (Mo. Cons. Comm.) SHORT-TAILED SHREW. Missouri Conservationist 14(8): 15-17, illus. Aug. 1953.
For comments on this series of valuable popular articles on Missouri mammals, see p. 48 of this issue of WR.

MAMMALS--RABBITS AND PIKAS

Andersen, Johs. FLUCTUATIONS IN THE FIELD HARE POPULATION IN DENMARK COMPARED WITH CERTAIN CLIMATIC FACTORS. Papers on Game Research 8: 41-43, graphs. 1952.
Danish shooting statistics show an upward trend in the L. europaeus population. A periodicity of ten years has been found, particularly in the curve smoothed by values of a three year sliding mean. The best agreement between climatic factors and hare fluctuation was found in the sums of monthly temperatures in February-May and in rainfall of June-July (diagrams presented). In no single month do weather conditions have any appreciable influence. No correspondence was found between hare and fox curves.--Teppo Lampio.

Brereton, John LeGay. (Bur. Animal Pop., U. Oxford, Eng.) INITIAL SPREAD OF MYXOMATOSIS IN AUSTRALIA. Nature 172(4368): 108-110, map. July 18, 1953.
Evidence that this disease does not jump (via windborne insects), but creeps along rivers (perhaps via rabbits) at a rate of about 3 miles per day. Incidence, however, varies with abundance of vectors.

Fenner, Frank. (Australian Nat. U., Canberra.) CHANGES IN THE MORTALITY-RATE DUE TO MYXOMATOSIS IN THE AUSTRALIAN WILD RABBIT. Nature 172(4371): 228-230. Aug. 8, 1953.

Herman, Carlton M. (Patuxent Refuge, Laurel, Md.) A REVIEW OF EXPERIMENTS IN BIOLOGICAL CONTROL OF RABBITS IN AUSTRALIA. Journal of Wildlife Management 17(4): 482-486. Oct. 1953.
Summary of history and experience. Eight references.

Janes, Ted. HE SHOWED THE EXPERTS. Outdoor Life 112(3): 48-51, 105-107, illus. Sept. 1953.
How the Greylock Sportsman's Club of North Adams, Mass., converted a game-poor tract of 100 acres into a cottontail heaven. Some stocking was done, but the chief tool was intensive application of habitat improvement. Despite the title, the habitat improvement measures used apparently were those generally recommended for cottontails, except that they were used more intensively than is usually possible. Strong club organization was necessary for carrying out the plan.

Kline, Paul D. AUTUMNAL DECIMATION OF MEARNS COTTONTAIL IN DECATUR COUNTY, IOWA, 1952. M. S. thesis, Iowa State College. 1953.

Krefting, Laurits W. (US F&WS.) SNOWSHOE HARE DAMAGE TO A JACK PINE PLANTATION IN MINNESOTA. U. S. Forest Service, Lake States Forest Experiment Station, Technical Notes no. 402. 1 p. July 1953.
Exclosure studies of young jack pines revealed loss of height but no mortality owing to hare damage. Growth was 41% in hare-proof section, 24% in section available to hares, and 20% in unprotected section. Seedlings protected from hares produced 2.5 times as much growth as others.

MAMMALS--RABBITS AND PIKAS--Continued

Lampio, Teppo. AN EXPERIMENT IN THE CONTROL OF DISEASE IN THE SNOW HARE. Papers on Game Research 8: 139-142. 1952.
Report on experiment carried on in Finland since 1948. Several diseases had badly reduced the hare population of the experimental island before 1948. Feeding stations (aspen, hay) were provided each winter to strengthen resistance to disease and to concentrate droppings, which carry germs. Areas with concentrations of droppings were treated with quick-lime early each spring. Foxes and crows were controlled. The hare population of the island has increased strongly although populations in the region have been violently reduced by diseases also present in the experimental population.--Teppo Lampio.

MAMMALS--RODENTS--MISCELLANEOUS

Baker, Rollin H. (U. Kans.) THE POCKET GOPHERS (GENUS THOMOMYS) OF COAHUILA, MEXICO. University of Kansas Publications Museum of Natural History 5(28): 499-514, map. June 1953.

Godfrey, Gillian K. (Bur. An. Pop., U. Oxford, Eng.) A TECHNIQUE FOR FINDING MICROTUS NESTS. Journal of Mammalogy 34(4): 503-505. Nov. 1953.
Pregnant females were banded with radioactive leg rings and their locations later determined with counters. The approach seems promising for use in various studies of other animals. The author also gives results of some of his nest study of M. agrestis.

Harris, Van T. (US F&WS, Lafayette, La.) ECOLOGICAL RELATIONSHIPS OF MEADOW VOLES AND RICE RATS IN TIDAL MARSHES. Journal of Mammalogy 34(4): 479-487. Nov. 1953.
Study made in Dorchester Co., Md. Data are given on activities, effect of water level fluctuations on voles, use of muskrat houses, distances traveled, reproduction, sex ratios, and occurrence of remains of these rodents in food habits material of several predators.

Hooven, E. F. SOME EXPERIMENTS IN BAITING FOREST LANDS FOR THE CONTROL OF SMALL SEED EATING MAMMALS. Oregon State Board of Forestry (Salem), Research Bulletin no. 8. 70 p. 1953. [From Journal of Forestry 51(9).]

Howard, Walter E. (U. of Calif. at Davis) GROWTH RATE OF NAILS ON ADULT POCKET GOPHERS. Journal of Mammalogy 34(3): 394-396. Aug. 1953.
Statistical study of variation in growth of different nails of several individuals. Nails of 3 middle toes of fore feet, which are most used for digging, grew about twice as fast as other nails.

Howard, Walter E. (U. Calif. at Davis.) A TRIGGER MECHANISM FOR SMALL-MAMMAL LIVE TRAPS. Journal of Mammalogy 34(4): 513-514, illus. Nov. 1953.
New, simple design. Address is given of company making trap.

Jackson, William B. (US Public Health Service.) USE OF NEST BOXES IN WOOD MOUSE POPULATION STUDIES. Journal of Mammalogy 34(4): 505-507. Nov. 1953.
Results of studies in N. J., 1950-51.

Jones, J. Knox, Jr. (U. Kans.) GEOGRAPHIC DISTRIBUTION OF THE POCKET MOUSE, PEROGNATHUS FASCIATUS. University of Kansas Publications, Museum of Natural History 5(29): 515-526, illus. Aug. 1953.
Taxonomic revision. Five races recognized, all previously described, but 2 of them not heretofore associated with this species.

Moore, J. E. (U. Alberta, Edmonton.) NOTES ON THE PALLID VOLE AND THE GRASSHOPPER MOUSE IN ALBERTA. Canadian Field-Naturalist 67(4): 154-156. Oct.-Dec. 1953.
Distribution, measurements, habitats, foods, and parasites of Lemmiscus curtatus pallidus and Onychomys leucogaster missouriensis.

MAMMALS--RODENTS--MISCELLANEOUS--Continued

Quast, Jay C., and Walter E. Howard. (U. Calif. at Davis.) COMPARISON OF CATCH OF TWO SIZES OF SMALL-MAMMAL LIVE TRAPS. Journal of Mammalogy 34(4): 514-515. Nov. 1953.
Test demonstrated that far more small mammals (especially 3 species of Peromyscus) were caught in large Sherman traps (3 x 3 x 10 in.) than in small ones (2 x 2.5 x 6.5 in.).

Roy, D. F., and G. H. Schubert. K-SCREEN SEED SPOTS. U. S. Forest Service, California Forest and Range Experiment Station (Berkeley 1), Forest Research Notes no. 88. 1-2 p. May 1953.
K-screens are 1 x 4-inch cylinders of 8-mesh hardware cloth. A K-screen is filled with seed and soil, one end is pinched partly shut, and the cylinder is placed on the earth. Rodents seldom can get at the seeds. On the other hand, the screens and their contents are subject to frost heaving, too much drying, trampling, digging-up, and other adverse factors. Tests are under way on a cylinder 2 inches longer, and on a cylinder 1 inch longer and attached to a stake that is driven into ground. Still needed is a material for filling the screens that would provide better germination than soil. At present, K-screens cannot be recommended.

Rubenstein, Boris B. (185 N. Wabash Ave., Chicago 1, Ill.) SPERM SURVIVAL IN RODENTS? Science 118(3071): 564. Nov. 6, 1953.
Suggests sperm survival as explanation of reproductive phenomena reported by Evans (WR 73:34).

Ryckman, Raymond E., and others. (School of Tropical Med., Loma Linda, Calif.) THE ELECTRIC FENCE AS AN AID IN FIELD STUDIES OF RODENTS AND THEIR ECTOPARASITES. California Fish and Game 39(4): 489-496, illus. Oct. 1953.
Used with California ground squirrel and with Rattus.--Neil Hotchkiss.

Schmidt-Nielsen, Knut and Bodil. (Duke U.) THE DESERT RAT. Scientific American 189(1): 73-74, 76, 78, illus. July 1953.
Semitechnical account of physiological adaptations by which kangaroo rats maintain their water balance even when they do not drink and are eating only dry food. Results of experiments are described.

Schwartz, Charles W. (Mo. Cons. Comm.) A NEW RECORD OF ZAPUS HUDSONIUS IN MISSOURI AND NOTES ON ITS HIBERNATION. Journal of Mammalogy 32(2): 227-228. May 1951.

Shaw, Elmer W. EFFECTS OF TETRAMINE USED FOR RODENT CONTROL IN DIRECT SEEDING OF DOUGLAS-FIR. U. S. Forest Service, Pacific Northwest Forest and Range Experiment Station (Portland 5, Ore.), Research Note no. 89. 1-7 p. Aug. 1953.
Tetramine (tetramethylene disulpho tetramine) is both toxic and repellent to rodents. Treated seeds distributed by helicopter gave an average of 1,390 seedlings per acre. Tetramine somewhat reduced germination and survival, but this is being corrected by new techniques. Germination and survival were slightly better when treated seeds were covered with soil. This was not true of untreated seeds.

Spencer, Donald A., and Nelson B. Kverno, compilers. RESEARCH IN RODENT CONTROL TO PROMOTE REFORESTATION BY DIRECT SEEDING / PROGRESS REPORT NO. 3. U. S. Fish and Wildlife Service, Wildlife Research Laboratory, Denver 2, Colo. 1-54 p., graphs, + 12 p. appendix. Aug. 1952.
Reports much detailed cooperative work with U. S. Forest Service and with industry. Most of the work pertained to tetramine (tetramethylene disulpho tetramine) as a repellent and its effect on germination. Some successful work was on operational scale. Conifers for which the treatment is or is not suitable are listed. Tetramine itself was found not harmful to seeds. Seedlings from tetramine-treated seeds are protected from mouse feeding for the first few weeks. Tetramine-treated seed may remain repellent after several

MAMMALS--RODENTS--MISCELLANEOUS--Continued

months of field exposure. Laboratory tests suggest that castrix nitrate (a rodenticide) can be used on spruce and certain other seeds where the present tetramine treatment cannot. The paper also reports various other experiments in seed handling and rodent control.

Stinson, R. H., and Kenneth C. Fisher. (U. Western Ont., London, Ont.) TEMPERATURE SELECTION IN DEER MICE. Canadian Journal of Zoology 31(4): 404-416, illus. Aug. 1953.
Experiments with 8-foot, thermal gradient tube. Animal chiefly used was P. m. bairdi. "The modes of the individual distributions varied from 20° to 28° C. thus accounting for the relative flatness of the combined distribution. The mode of the combined distribution was 24°C." Tests "point to the conclusion that it is the temperature of the substratum on which the animal walks that determines its response."

Tevis, Lloyd, Jr. (U. Calif. at Davis.) PAPER DOES NOT PROTECT SEED FROM MICE IN NORTHWESTERN CALIFORNIA. Journal of Forestry 51(12): 908-909. Dec. 1953.
Critique of Hattersley's paper (WR 74:45) and report that seed spots "protected" by paper were robbed as freely as control spots. All seed spots had been robbed by the 8th day.

MAMMALS--RATTUS AND MUS

Anonymous. CONTROL OF HOUSE MICE. U. S. Fish and Wildlife Service, Wildlife Leaflet 349. 1-4 p., illus. Oct. 1953.
Summarizes biology of house mice and discusses trapping, poisoning, and other control measures.

Barnett, S. A. THE BIOLOGY OF RAT POPULATIONS. Surgo, Glasgow. 111-115 p., illus. Candlemas, 1952. [From Journal of Mammalogy 34(3).]

Bellack, E., J. B. DeWitt, and R. Treichler. (Patuxent Refuge, Laurel, Md.) RELATIONSHIP BETWEEN CHEMICAL STRUCTURE AND RAT REPELLENCY. National Research Council (Washington, D. C.), Chemical-Biological Coordination Center Review no. 5, part 2. 48-156 p. 1953. Parts 1 & 2 bound together, $1.75.
Repellent activity is defined as the activity of a compound in preventing consumption of, or gnawing attacks upon, foodstuffs or articles containing or treated with the candidate substance. Data are presented on repellency indices of 2700 compounds, and it is shown that repellency is associated with specific functional groups attached to alkyl, aryl, or heterocyclic nuclei. Functional groups containing nitrogen, sulfur or halogens are most active, with amines, imides, thiocyanates and thiocarbamates forming some of the most active classes. Activity of any functional group may be affected by molecular weight, unsaturation, or spatial configuration of the nucleus, or by the presence of additional substituent groups.--J. B. DeWitt

Bonnet, David D., and Bertram Gross. (Territorial Dept. Health, Honolulu.) SUSCEPTIBILITY OF RATTUS HAWAIIENSIS STONE TO WARFARIN. Science 118(3054): 44-45. July 10, 1953.
Experiments prove this species much harder to control with warfarin than are most rats.

DeWitt, J. B., E. Bellack, C. W. Klingensmith, J. C. Ward, and R. Treichler. (Patuxent Refuge, Laurel, Md.) RELATIONSHIP BETWEEN CHEMICAL STRUCTURE AND TOXIC ACTION ON RATS. National Research Council (Washington, D. C.), Chemical-Biological Coordination Center Review no. 5, part 1. 1-47 p. 1953. Parts 1 & 2 bound together, $1.75.
Data are presented on toxicities of approximately 1,000 compounds, and effects of introduction of different chemical groups are discussed.--J. B. DeWitt.

MAMMALS--RATTUS AND MUS--Continued

Oliff, W. D. (Plague Res. Lab., Dept. Health, Johannesburg, S. Af.) THE MORTALITY, FECUNDITY AND INTRINSIC RATE OF NATURAL INCREASE OF THE MULTIMAMMATE MOUSE, RATTUS (MASTOMYS) NATALENSIS (SMITH) IN THE LABORATORY. Journal of Animal Ecology 22(2): 217-226, graphs. Nov. 1953.
Of interest to those concerned with life-tables and fecundity-schedules. Results are compared with field data.

Orgain, Holmes, and Martin W. Schein. (Md. Health Dept., Balt., Md.) A PRELIMINARY ANALYSIS OF THE PHYSICAL ENVIRONMENT OF THE NORWAY RAT. Ecology 34(3): 467-473, graphs. July 1953.
Quantitative study of harborage and food as factors affecting rat populations in Baltimore. Food was chief limiting factor. Populations were experimentally increased and decreased by manipulating food supply. A weighted system of rating harborage was developed and ratings were correlated with populations.

Sallow, William. (Balt. Health Dept.) AN ANALYSIS OF RATBITES IN BALTIMORE, 1948-52. Public Health Reports 68(12): 1239-1242. Dec. 1953.

Storer, Tracy I., and David E. Davis. (U. Calif. at Davis.) STUDIES ON RAT REPRODUCTION IN SAN FRANCISCO. Journal of Mammalogy 34(3): 365-373. Aug. 1953.
Authors' summary: "Data on the reproductive condition of a large series of Norway rats (12,962 females) and roof rats (3,633 females) were collected from 1925 to 1928 in San Francisco. ...Prevalence of pregnancy for Norway rats had peaks in May and September, but for roof rats no regular fluctuations were apparent. Norway rats (2,768 pregnant 'large' females) averaged 9.0 embryos, and roof rats (978 pregnant 'large' females) averaged 7.3 embryos. There were no regular seasonal trends in mean embryos. Norway rats showed some resorption of embryos (6 per cent). Prevalence of pregnancy increased with length or weight of Norway rats, but number of embryos did not. The incidence of pregnancy was 4.3 per 'large' Norway rat female and 5.4 per 'large' roof rat female, per year. The respective embryo rates per year were 39 and 40."

MAMMALS--SCIURIDS

Allison, Ray. [Final MS prepared by F. S. Barkalow and Mrs. B. G. Poole.] NORTH CAROLINA GRAY SQUIRREL INVESTIGATIONS, 1947-1950. North Carolina Wildlife Resources Commission, Final Report of Project N. C. 26-R. vii + 61 + 21 p. appendix, illus. Sept. 1953.
Based on hunter-harvest questionnaires, game protector reports, and a moderate amount of data from local live-trapping study. The authors point out that the best studies of breeding in this species have been done in England, and that the many "practical" studies made in this country have been too brief or incomplete, and have fallen far short of answering any but the most superficial questions. A strong point of the present paper is that the authors' data are integrated with information from the literature. Topics discussed include: marking (ear tags good, toe bands injurious); description of new type of trap; evidence of shock disease; sex ratios; external age characters; seasonal weights, by age classes; reproductive cycle; litter size; number of litters; population trends in state; incidence of bot larvae and waste of game because of them; factors affecting habitat quality; need of further testing nest boxes; adjustment of hunting season for least loss of young in nests and least waste of game because of bots.

Gabel, James Russel. THE MORPHOLOGY AND TAXONOMY OF THE INTESTINAL PROTOZOA OF THE AMERICAN WOODCHUCK MARMOTA MONAX, LINNAEUS. PhD thesis, University of Pennsylvania. 124 p. 1953. [From Dissertation Abstracts 13(5).]

MAMMALS--SCIURIDS--Continued

Hawbecker, Albert C. (Fresno St. Coll.) ENVIRONMENT OF THE NELSON ANTELOPE GROUND SQUIRREL. Journal of Mammalogy 34(3): 324-334, maps. Aug. 1953.
Analysis of factors that may or do govern the species' range. Includes much information on habits and ecology.

Hoover, Robert L., and Lee E. Yeager. (Colo. A & M Coll.) STATUS OF THE FOX SQUIRREL IN NORTHEASTERN COLORADO. Journal of Mammalogy 34(3): 359-365, map. Aug. 1953.
Through stocking and natural invasion, fox squirrels now occur on about 2,400 square miles of the South Platte drainage and adjacent irrigated lands. Of the various foods reported, grain was most important. Damage reports were few. Peak of pregnancy was in early March. Average size of 9 litters was 3.66. Sex ratio was 121 males per 100 females. Squirrels have no legal protection in Colorado, but hunting pressure is light, and many landowners protect them.

Lampio, Teppo. SQUIRREL HUNTING BASED ON THE ECOLOGY OF THE SPECIES. Papers on Game Research 8: 44-49, graph. 1952.
The plan presented for squirrel hunting is based on extensive Finnish investigations of squirrel ecology. Food is the most important factor, but is variable in different years. The life-sustaining potential of the habitat depends primarily on availability of spruce seeds. A high potential keeps reproduction and survival high. As active management of squirrels is impossible, the best method for increasing the catch is to balance the hunting with the density of the population and the life-sustaining potential of the habitat. The supply of spruce seeds can be foreseen roughly two years in advance. For planning the length of each hunting season, there are three things of importance to study annually: abundance of the population, the present level of life-sustaining potential of habitat, and the future development of it (and thus of the squirrel population) during two coming years. A schematic presentation of harvesting squirrels under different combinations of these factors is given. Refuges are probably more harmful than beneficial in squirrel management.

Mayer, William V. (U. So. Calif.) A PRELIMINARY STUDY OF THE BARROW GROUND SQUIRREL, CITELLUS PARRYI BARROWENSIS. Journal of Mammalogy 34(3): 334-345, illus. Aug. 1953.
Distribution, habitat, home territory, relations to humans, habits, voice, food, burrow systems, nest, young, and growth.

Tevis, Lloyd, Jr. (U. of Calif. at Davis.) STOMACH CONTENTS OF CHIPMUNKS AND MANTLED SQUIRRELS IN NORTHEASTERN CALIFORNIA. Journal of Mammalogy 34(3): 316-324, illus. Aug. 1953.
Reports stomach contents of 509 chipmunks of 4 species (Eutamias amoenus, speciosus, townsendi, quadrimaculatus) and 273 Citellus lateralis. Conclusions: "From the standpoint of forestry, the chief conclusion that derives from this study...is the impracticality of assigning each species of rodent an economic rating. Interrelations within the forest are too complex and changeable. A species that is harmful at one place or at one time may be beneficial nearby or later in the season or at the same time another year. A better approach to an evaluation of the rodent factor in forest ecology is Duncan Dunning's philosophy of silviculture: every area with its plants and animals should be studied and managed as a unit unto itself."

Yerger, Ralph W. (Fla. St. U., Tallahassee.) HOME RANGE, TERRITORIALITY, AND POPULATIONS OF THE CHIPMUNK IN CENTRAL NEW YORK. Journal of Mammalogy 34(4): 448-458. Nov. 1953.
Results of 1-year study at Ithaca. 218 individuals were studied by trapping and direct observation. Average size of home range in acres (calculated by minimum area method) was 0.37 for adult males, 0.26 for adult females, and 0.18 for juveniles. The habitat was considered favorable.

MAMMALS--SCIURIDS--Continued

Most individuals occupied the same ranges for long periods. Home ranges overlapped broadly, but territorial behavior was noted. Populations varied from 4.14 to 15.23 per acre, except for one spot where there were 10 in 1/3 acre for a time.

MAMMALS--BEAVER

Hodgdon, Kenneth W., and John H. Hunt. (Me. Dept. Game.) BEAVER MANAGEMENT IN MAINE. Maine Department of Inland Fisheries and Game, Game Division Bulletin no. 3. ix + 102 p., illus. June 1953.

Detailed paper based on work of several men since 1946. It should be seen by anyone concerned with beaver management. Much of the biological information cannot be mentioned in a brief review. Among major topics are history in state, weights and measurements, life history, ecological relations to other animals, economics, and management recommendations. Some of the graphs show (usually by age groups): incisor width, skinned weights, tail area, hind foot length, furred length, total length, breeding dates calculated from embryo weights, growth of young, and size groups of pelts. Predation on beaver was insignificant. Parasitism (reported quantitatively) was common but seemed to be of no population importance. Effect of beaver on other game was beneficial. Effect on trout was often beneficial, sometimes harmful. Effect on valuable timber was slight, and most big timber owners favor present beaver populations, partly because they aid fire control. Beaver populations and carrying capacity were determined for each township of state; management will be based partly on these figures. Trapping season should be in March, after mating season. Trapping should be regulated by township or stream, with closure when necessary, and with length of season set for state by game commission. Beaver farming was found to be unprofitable.

Knudsen, George J. (Wis. Cons. Dept.) BEAVER DIE-OFF. Wisconsin Conservation Bulletin 18(9): 20-23, map. Sept. 1953.

In spite of heavy trapping in recent years, hundreds of beaver were killed by disease in Wis. in 1953. Some of the disease was proved to be tularemia. At least 86 colonies (mapped) were hit by disease, with 2-9 carcasses found floating at each colony. Muskrats were at a high level and unusually large fall and winter die-offs have been reported. It is not known whether tularemia is responsible. Heavy trapping of both beaver and muskrat to impede spread of disease and prevent waste of pelts is recommended.

Thomas, Earl M. (Wyo. Game Comm.) THE FUR-BEARING MAMMALS OF WYOMING. Wyoming Wild Life 17(9): 16-25, illus. Sept. 1953.

19th and final installment. Habits, status, and economics of beaver. Need of new state legislation for beaver management is discussed. Table lists numbers and values of beavers harvested in state, 1941-52.

Townsend, Joseph E. (Mont. Game Dept.) BEAVER ECOLOGY IN WESTERN MONTANA WITH SPECIAL REFERENCE TO MOVEMENTS. Journal of Mammalogy 34(4): 459-479, map and graphs. Nov. 1953.

Based on 3 summers of work on a 160-acre area. Live-trapping and observation were used. Marking by web punching was not found suitable for large scale studies, marks becoming obscure. Weights and measurements are correlated with age classes. Activities and foods are discussed. Movements of individuals and changes in colony composition are treated at length. Both yearlings and 2-year-olds may travel. The latter appear to become settled in late summer. Adult males travel considerably in summer, much more than breeding females. Data suggest that adult males do not remain with breeding females in spring and early summer. Population pressure seems to determine colony limits. Composition of colonies varies with season and year.

MAMMALS--MUSKRAT AND NUTRIA

Artimo, Atso. SIGNS OF MUSKRAT (Om de spår bisamråttan lämnar i naturen). Papers on Game Research 8: 63-76, illus. 1952.
Swedish, English summary. The paper describes the most common signs of muskrat upon which population estimates can be based if reliable trapping statistics are not available. Signs discussed are: houses of different kinds, feeding remains, tracks, vegetationless travel routes, air bubbles under ice, vegetationless patches around the winter houses, breathing holes in the ice, holes in net fish traps, and sounds. The best time for an evaluation of the muskrat population is the fall and early winter, when the population is at its height and when most signs are to be found.--Teppo Lampio.

Beshears, W. Walter, Jr. (Ala. Dept. Cons.) MUSKRATS IN YOUR FARM POND. Alabama Conservation 25(1): 4-5, 22, illus. July-Aug. 1953.
Popular article that reviews muskrat biology briefly, tells how to protect dams from muskrats, and how to encourage and trap muskrats for profit. "One owner trapped 23 muskrats from his 2.5-acre pond, a harvest of 9.2 per acre. Another removed 11 from a ¼-acre pond."

Beshears, W. Walter, Jr., and Arnold O. Haugen. (Ala. Dept. Cons.) MUSKRATS IN RELATION TO FARM PONDS. Journal of Wildlife Management 17(4): 450-456. Oct. 1953.
Based on studies at 89 ponds in Alabama. Describes burrows and damage to dams. Methods of building dams to alleviate damage are discussed, and control by steel-trapping is recommended. Sex ratio was 108 males per 100 females. Females averaged 12.7 placental scars, with average of 4 young per litter. Young constituted 70% of trapping season population. Limited winter breeding was found. Average distance traveled was about 50 yards, with maximum of about 500 yards, although 1 male migrated about 8½ miles. Owner of a 2½-acre pond trapped 23 muskrats (9.2 per acre) in 1 season. Sale value of 74 pelts averaged $2.80.

Dorney, Robert S., and Alan J. Rusch. (Wis. Cons. Dept.) MUSKRAT GROWTH AND LITTER PRODUCTION. Wisconsin Conservation Department, Technical Wildlife Bulletin no. 8. 1-32 p., illus. 1953.
Muskrat houses on part of the Horicon Marsh, Wis., were broken into at 10-day intervals. Young were marked by toe clipping. About half of the litters studied were moved by adults to new houses that were seldom more than 50 feet away. About 2/3 of marked young had moved less than 300 feet when steel-trapped in fall. Some caught at distances of more than 300 feet seemed to have moved more or less as litters. Aging criteria were based mainly on condition of umbilicus, body weight, and tail length. Growth regressions were calculated for kits (up to 30 days) and immatures (31-199 days). Immature males averaged heavier than females of same age. Peak of production in 1950 was in May, with lesser peak in June. Last litters were born in Sept. Birth dates of immatures trapped in Nov. could be estimated from their weights. In general, mortality between ages of 6 and 24 days affected whole litters. After 24 days it occurred at random. Mortality of litters may have been increased by handling.

Howard, Walter E. (U. Calif. at Davis.) NUTRIA (MYOCASTOR COYPUS) IN CALIFORNIA. Journal of Mammalogy 34(4): 512-513. Nov. 1953.
History, distribution, and control problems. The animals are a severe threat to irrigation structures and have relatively little fur value. Control efforts are vigorous, but extermination is difficult. An area that seems completely trapped out one year yields a large number the next year.

McCullough, Robert A. (Wilhelm Reich Foundation, Rangeley, Me.) A CASE OF AN UNUSUALLY LOW JUVENILE MORTALITY FOUND IN MUSKRATS IN NORTHERN NEW HAMPSHIRE. Proc. NE. Section Wildlife Soc., 9th Annual Conf., Bretton Woods, N. H., Sept. 20-23, 1953. 1-3 p.
Placental scars of muskrats trapped in fall of 1951 indicated that an average of 14.61 young per female had been produced that year. Age ratios

MAMMALS--MUSKRAT AND NUTRIA--Continued

indicated that 11.73 young per female had been reared to harvest. This juvenile mortality of 19.64% is exceptionally low. In most studies, juvenile mortality has ranged from 47-82%.

Wragg, L. E. (U. Wis.) NOTES ON THE LIFE HISTORY OF THE MUSKRAT IN SOUTHERN ONTARIO. Canadian Field-Naturalist 67(4): 174-177. Oct.-Dec. 1953.
Based on 1 season of study. Author's summary: "Although muskrats may breed all year round in southern United States, they do not generally do so before ice goes out in spring in southern Ontario. After a gestation period of 28-30 days a litter averaging six, somewhat larger than litters of southern U. S., is born. A family inhabiting a cabin does so until the young become independent at 4-6 weeks, when it is usually abandoned. These animals, and other adults without young, may live in open nests, building a cabin only when a litter is expected. In fall probably all marsh muskrats construct winter houses." Information also is given on care of young and hardiness of young.

MAMMALS--FURBEARERS--GENERAL

Ashbrook, Frank G., compiler. ABSTRACT OF FUR LAWS, 1952-53. U. S. Fish and Wildlife Service, Wildlife Leaflet 343. 1-43 p. Oct. 1952.
Digest of laws pertaining to furs and fur-bearers. Laws of all North American states and provinces are included. Addresses of all state and provincial game departments are listed.

Ashbrook, Frank G. ABSTRACT OF FUR LAWS, 1953-54. U. S. Fish and Wildlife Service, Wildlife Leaflet 347. 1-41 p. Oct. 1953.
Laws of each state, province, or territory of America north of Mexico.

Ashbrook, Frank G., compiler. ANNUAL FUR CATCH OF THE UNITED STATES. U. S. Fish and Wildlife Service, Wildlife Leaflet 346. 1-24 p. July 1953.
Size of known catch, by species, in Alaska and each state, usually for each year from 1947 to 1952 inclusive. Some states still have no satisfactory reporting system. Demand for long-haired furs was increasing, with improved markets for fox, raccoon (especially northern), wolf, and coyote.

Nagel, Werner O. (Mo. Cons. Comm.) THE HARVESTS, ECONOMIC VALUES, AND SOIL-FERTILITY RELATIONSHIPS OF MISSOURI FURBEARERS. Missouri Conservation Commission. 1-42 p., graphs. Aug. 1953.
Sums up results of several extensive studies. Part I. Report of raccoon study. Raccoons were scarce in the 1930's. A tag system was used to control harvest. It served its purpose but was abandoned when populations rose. It gave some good data, including the fact that hunters killed more raccoons than did trappers. Part II. Analysis of depredations by foxes. Counties having greatest fox abundance had largest pelt harvest, most fox damage, and most kill of foxes as predators; but all this kill did not reduce depredations adequately. Part III. Desirability of encouraging muskrats in farm ponds. Not one case of serious damage was found in a pond built and maintained according to specifications. Part IV. A study of the economic value, distribution and population trends of Missouri furbearers. In general, furbearers increased from the 1930's to the 1940's. Methods of improving fur reports and interpreting harvest data are discussed at length. Part V. Furbearers and soil fertility. Much information is reviewed to show that numbers, weight, pelt size, and pelt quality tend to vary directly with fertility of soil or water. Largest harvests are in medium-fertility areas, because most fertile areas are too intensively farmed. Wild land of low fertility produces few and poor fur animals. Management should pay off well in fertile areas, poorly in sterile areas unless fertility can be improved.

MAMMALS--BEARS

Chase, Greenleaf. (N. Y. Cons. Dept.) BEAR FACTS. New York State Conservationist 8(3): 10, 31, illus. Dec.-Jan. 1953-54.
Bears are becoming too common in parts of the Adirondacks, doing damage and crowding into garbage dumps. The blow-down provides food and sanctuary. Bear hunting is declining and too few bears are harvested. The author believes the open season should be earlier and longer, bag limits should be larger, and age limits should be removed.

Cooney, Bob. (Mont. Game Dept.) THARS BAR IN THEM THAR HILLS. Montana Wildlife 3(3): 15-18, illus. Fall 1953.
Montana has about 800 grizzlies and is determined to keep them. Studies made about 10 years ago are to be followed by rechecks in 1953. Census is based partly on tracks, measurements of which are distinctive for individuals of an area. Seasonal foods are described in this article. Vegetable material, including grass, makes up a surprisingly large part of the diet. Rodents are a minor item, and game animals are taken so rarely as to be insignificant. Spring hunting seasons for grizzlies have been eliminated, and a system of open and closed areas has been set up for protection of the breeding stock.

Merrill, Alfred H. BEARS HAMPER TREE GROWING IN CALIFORNIA. Journal of Forestry 51(12): 928-929. Dec. 1953.
At present rate of destruction, bears may reduce Hammond Lumber Company's next timber crop by 400 million board feet in 40 years. "The bears strip the bark off the growing redwood and Douglas-fir trees to eat the thin cambium layer directly below... One bear may kill twenty to forty trees in a single day. The tree damage period runs from 75 to 100 days in the spring and summer months. The bears have destroyed 1660 acres of Hammond Lumber Company's young timber. They are killing about 47,000 trees each year." The California Department of Fish and Game has declared an all-year open season for bear hunting in Humboldt and Mendocino counties.

MAMMALS--RACCOON AND RINGTAIL

Rankston, J. D., and Hart Stilwell. A NEW KILLER. Outdoor Life 112(6): 48-49, 140, illus. Dec. 1953.
In central Texas, where larger predators have been killed off and raccoons have increased greatly, individual raccoons are taking to sheep killing. One rancher reported losing 30 grown sheep and almost 200 lambs. In a case described in detail, killing of 1 male coon temporarily stopped the trouble. The authors attribute the trouble to drought, overgrazing, and light trapping of raccoons. They fear that poisoning campaigns will be started if more people do not build up hound packs to run down killers and to thin out the raccoons.

Keefe, Jim. (Mo. Cons. Comm.) KNEE DEEP IN COONS. Missouri Conservationist 14(11): 10-11. Nov. 1953.
Raccoons were so scarce in the 1930's that Missouri undertook to cut the bag. In 1940 only 11,000 were taken in the state. Around 1941 an increase appeared almost all over the U. S. The increase speeded up about 1943 and has kept going to date. The 1952 take in Mo. was 121,000. Coons spread into new areas. Sex ratios still show a predominance of females. Now there are some 207 young per 100 adults where there were only 91 per 100 in 1941. These figures indicate that the population is still rising. Study of sign in field indicates the same. Reasons for the spectacular eruption are unknown. Nevertheless, it is only a question of time until something strikes and coon populations plummet.

Moore, Joseph Curtis. (Everglades Nat. Park.) RACCOON PARADE. Everglades Natural History 1(3): 119-126, illus. Sept. 1953.
New or unusual observations on raccoons in extreme southern Florida. Where no fresh water was available from ordinary sources, raccoons were seen licking dew, and many were found to use shallow wells they had dug at Cape Sable. Use was heaviest at mid-day. Occurrence of heavily used scat stations is also recorded.

MAMMALS--RACCOON AND RINGTAIL--Continued

Tester, John R. (Colo. A & M Coll.) FALL FOOD HABITS OF THE RACCOON IN THE SOUTH PLATTE VALLEY OF NORTHEASTERN COLORADO. Journal of Mammalogy 34(4): 500-502. Nov. 1953.
97 scats and 3 tracts.

MAMMALS--MUSTELIDS

Anonymous. ICELAND'S MINK ARE MENACE TO WILDLIFE. Modern Game Breeding and Hunting Club News 22 [sic, should be 23] (8): 13. Aug. 1953.
Escaped fur farm mink have multiplied and spread over the southwestern part of Iceland. They are said to have become a problem because of predation on birds and fish. "The government has placed a price on the mink's head, but it continues to increase...A proposal to outlaw mink farming has not met with success."

Gilfillan, Merrill C. FURY IN A FUR COAT. Ohio Conservation Bulletin 17(8) [sic]: 2-3, 32, illus. Sept. 1953.
This popular account of mink habits states that the take of mink in Ohio has been declining. Data from Ohio fur buyers for the years from 1943-44 to 1951-52 show that while the catch was 17,822 in 1944-45, it was only 6,040 in 1950-51. The decline is attributed to loss of habitat.

Krog, John. (Arctic Health Res. Center, Anchorage, Alaska.) NOTES ON THE BIRDS OF AMCHITKA ISLAND, ALASKA. Condor 55(6): 299-304, illus. Nov.-Dec. 1953.
Study of bald eagle foods (listed) revealed that young sea otters were being killed and eaten. Other animals were scarce, but sea otter populations were high, perhaps with more than 1500 in the Amchitka colony. It is suggested that the otter population may be too high for its own good and that further efforts at transplanting should be considered.

Latham, Roger M. (Pa. Game Comm.) SIMPLE METHOD FOR IDENTIFICATION OF LEAST WEASEL. Journal of Mammalogy 34(3): 385. Aug. 1953.
Skins of least weasel appear vivid lavender under ultra-violet light, while those of the other 2 weasels in Pennsylvania remain dull brown. "It appears possible that this method could be applied to other species difficult to identify by ordinary means."

Leekley, James R., Raymond G. Landgraf, Jr., Jeanne E. Bjork, and William A. Hagevig. SALMON CANNERY WASTE FOR MINK FEED. U. S. Fish and Wildlife Service, Fishery Leaflet 405. 1-31 p., illus. Nov. 1952.
Detailed report of experiments in Alaska.

Rausch, Robert, and Betty Locker. STUDIES ON THE HELMINTH FAUNA OF ALASKA. II. ON SOME HELMINTHS PARASITIC IN THE SEA OTTER, ENHYDRA LUTRIS (L.). Proceedings of the Helminthological Society of Washington 18(1): 77-81, illus. 1951. [From Polar Record 6(46).]
"5 species (Trematoda and Acanthocephala) found in 3 animals."

Rausch, Robert. (Arctic Health Res. Center, Anchorage, Alaska.) STUDIES ON THE HELMINTH FAUNA OF ALASKA. XIII. DISEASE IN THE SEA OTTER, WITH SPECIAL REFERENCE TO HELMINTH PARASITES. Ecology 34(3): 584-604, illus. July 1953.
Many sea otters died of disease at the Aleutian island of Amchitka in 1951 and some in 1952. This paper reports on parasites and diseases found in sick and dead otters. Several parasites and their effect on the host are discussed. All or nearly all of the parasites are chiefly parasites of seals. Two of them, the fluke Microphallus pirum and the nematode Porrocaecum decipiens, are considered pathogenic in otter. Bacterial enteritis was also found. There may be too many otters at Amchitka; preferred foods are greatly reduced and disease seems unnaturally high. Limited harvesting and transplanting (by air) are recommended.

MAMMALS--DOGS, WOLVES, FOXES

Banfield, A. W. F. (Canadian Wildl. Service.) THE RANGE OF INDIVIDUAL TIMBER WOLVES (CANIS LUPUS). Journal of Mammalogy 34(3): 389-390. Aug. 1953.
Data on recoveries of 2 wolves tagged as young in vicinity of Banff National Park. Capture sites for 1 were only 16 miles apart and on a well known wolf circuit. Capture sites for the other were 162 miles apart, across several valleys and mountain ridges. The author believes that the second animal had changed to another range.

Bowers, Robert R. (Va. Game Comm.) THE FREE-RUNNING DOG MENACE. Virginia Wildlife 14(10): 5-7, illus. Oct. 1953.
"In southwest Virginia, during a two-month winter period, these dogs killed more deer than the legal hunters bagged during the open season. The condition is duplicated in many other localities." Dogs are believed to be responsible for a large percentage of turkey nest losses and desertions. More damage is done to poultry and livestock by dogs than by wild predators. Approximately 40,000 unlicensed dogs are killed by Va. Game Commission each year, and at least 10,000 dogs are killed on highways. Some licensed dogs are found miles from home. The problem is likely to continue as long as people abandon animals and allow their pets to roam.

Chiasson, Robert B. (U. Ariz.) FLUCTUATIONS OF SOME ILLINOIS FOX POPULATIONS. Ecology 34(3): 617-619, graphs. July 1953.
Study of bounty results in certain counties, 1940-50. From author's summary: "There was a rise in the number of foxes bountied each year until 1943, with a drop for 1944 and a steady rise from 1944 until the peak of 1947... This indicates a major peak in fox populations preceded by a minor increase with the latter being followed by a slight decline. It would be interesting to know whether or not this were actually the case. In most instances it appears from the available data that a decline in Illinois fox populations began in 1948 or 1949 and is still continuing..."

Hakala, D. Robert. WOLF ON ISLE ROYALE! Nature Magazine 47(1): 35-37, illus. Jan. 1954.
On this island national park of moose overpopulation, wolves are known to have been present since 1950, and at least 4 were there in 1952. They are thought to have reached the island when it was connected to the mainland by ice.

Manville, Richard H. (Mich. St. Coll.) LONGEVITY OF THE COYOTE. Journal of Mammalogy 34(3): 390. Aug. 1953.
Captive died of cancer at age of 15 years.

Robinson, Weldon B. (US F&WS, Denver 2, Colo.) COYOTE CONTROL WITH COMPOUND 1080 STATIONS IN NATIONAL FORESTS. Journal of Forestry 51(12): 880-885. Dec. 1953.
Report on studies of placement of stations to avoid killing other animals, especially fur-bearers. Toxicity to other animals is stated, and information on home ranges and habitats of these animals is reviewed in detail, with some original information presented. Species chiefly discussed are marten, weasel, mink, red fox, and bear. Stations ordinarily are set far apart--1 per township of 36 square miles--so ranges of most individual small fur-bearers do not reach them. If they are also set well out in the open away from trees and brush, and 1/4-mile from streams, few martens, weasels, and minks will be killed. Apparently coyotes move down from the mountains more than foxes do, so many foxes can be saved by placing stations in lower mountainous areas. Bears can be saved by exposing baits only while bears are in hibernation. Various observations indicate that bird populations are not seriously affected by 1080 stations.

MAMMALS--DOGS, WOLVES, FOXES--Continued

Thomas, Earl M. (Wyo. Game Comm.) THE FUR-BEARING MAMMALS OF WYOMING. Wyoming Wild Life 17(8): 22-29, 38, illus. Aug. 1953.
Eighteenth installment. Review of habits, biology, and economics of coyote.

MAMMALS--CATS

Bue, Gerald T., and Milton H. Stenlund. (Minn. Div. Game.) RECENT RECORDS OF THE MOUNTAIN LION, FELIS CONCOLOR, IN MINNESOTA. Journal of Mammalogy 34(3): 390-391. Aug. 1953.
Since 1945, more than 20 sight records have been reported. Five of these, by qualified observers, are described.

MAMMALS--BIG GAME--GENERAL

Anonymous. AVAILABILITY OF SURPLUS BIG-GAME ANIMALS ON NATIONAL WILDLIFE REFUGES. U. S. Fish and Wildlife Service, Leaflet WL 341. 1-6 p. Sept. 1952.
Information needed by those interested in ordering living or butchered elk and bison. Longhorn cattle are sold only at public auction. Deer are available only to public agencies.

Baker, Theodore C., Chester Anderson, and William I. Crump. (Wyo. Game Comm.) FOOD HABITS STUDY OF GAME ANIMALS. Wyoming Wild Life 17(11): 24-31, illus. Nov. 1953.
Based on analysis of stomach contents of 30 antelope, 7 elk, 9 mule deer, 11 white-tailed deer, and 15 moose, all from Wyoming, supplemented by field observations. Foods eaten are discussed.

Essen, L. von. THE DEER SITUATION IN SWEDEN (Kort orientering om hjortviltets utbredning i Sverige samt därmed sammanhängande problem). Papers on Game Research 8: 158-160. 1952.
Swedish, English summary. Author's summary: "In 1951, the kill of the roe deer in Sweden was ca. 20 000, of the moose 18 600 and of the fallow deer 450. The roe deer is firmly established all the way up to Jämtland. Fallow deer have been released in various localities up to central Sweden, whereas an indigenous population of ca. 200 head of red deer is found only in Skåne." The densest moose population is found in central Sweden, where there are about 11 moose per 1 000 hectares. Deer damage both forests and crops.--Teppo Lampio.

Hickie, Paul, compiler. INVENTORY OF BIG-GAME ANIMALS OF THE UNITED STATES, 1952. U. S. Fish and Wildlife Service, Wildlife Leaflet 348. 1 p. + folding table. Aug. 1953.
Valuable and interesting tabulation showing estimated kill and total number after kill of each big-game species in each state. Totals for U. S. are given for species, and totals of all species for states. Wild turkeys are included, as are 4 species of exotic game. The only species that are disturbingly low on a national basis are caribou (35, only in Idaho) and grizzly (908, mostly in Montana). State by state, however, many figures are small: black bears near the vanishing point in several southeastern states, only 1000 peccaries in New Mexico, 25 bighorns in Texas, 750 turkeys in Kentucky, etc. [Would it not be worthwhile to have a comparable tabulation for the larger predators?]

Leopold, A. Starker, and F. Fraser Darling. WILDLIFE IN ALASKA / AN ECOLOGICAL RECONNAISSANCE. Ronald Press Co., N. Y. ix + 129 p., illus. 1953.
Sponsored by the Conservation Foundation, the distinguished authors of this book traveled over much of Alaska in the 4 summer months of 1952, studying big game conditions and interviewing many persons who were in a position to contribute information and opinions. The resulting book is short, interesting, and easily read. The authors do not pretend to offer final, specific judgments, but their thoughts merit the consideration of all those interested in

MAMMALS--BIG GAME--GENERAL--Continued

Alaskan wildlife and the development of Alaska. They point out that wildlife is--and with proper management should remain--one of the chief resources of the territory. Caribou have decreased chiefly because of destruction of winter lichen ranges by fire and reindeer. On the Arctic Slope they probably are as abundant as ever and there is danger of overpopulation and range damage. Reindeer crashed primarily because of exhaustion of winter range; herds should be limited and grazing pressure distributed. Moose have increased and spread under favorable range conditions. In some areas they are too abundant for their range and too little harvested. Heavier harvesting, with both sexes shot, is desirable in some areas. Sitka deer are starving and require heavier harvests. Ecology of Dall sheep, mountain goat, muskox, bison, and elk is discussed briefly. Government programs are criticized for taking too little account of range condition as the basic factor, for overprotecting some species in some areas from hunters and predators, and for not being sufficiently integrated (between agencies) for fire control and education.

MAMMALS--HOOFED (Except deer)

Baker, Theodore C. ANTELOPE MOVEMENT AND MIGRATION STUDIES. Wyoming Wild Life 17(10): 30-36, illus. Oct. 1953.
In Albany Co., Wyoming in 1952.--Neil Hotchkiss.

Banfield, A. W. F. SECOND REPORT ON THE BARREN-GROUND CARIBOU INVESITGATION. Arctic Circular 5(4): 43-44. 1952. [From Polar Record 6(46).]

Bromée-Skuncke, Folke. ÜBER ZAHNENTWICKLUNG UND ZAHNABNUTZUNG BEIM RENTIER, VERGLEICHEN MIT DENEN BIE EINIGEN ANDEREN CERVIDEN. STUDIEN AN SKANDINAVISCHEN ZAHM- UND WILDRENTIEREN. Arkiv för Zoologi (Stockholm), new ser. Vol. 4(1): 1-43. 1952. [From Journal of Mammalogy 34(3).]

Brooks, James W. (U. of Alaska.) A RECORD OF NORTH AMERICA'S MOST WESTERLY MOOSE. Journal of Mammalogy 34(3): 396-397. Aug. 1953.
Shot at Cape Prince of Wales on Alaska's Seward Peninsula. The area is separated from normal moose habitat by nearly 200 miles.

Jones, Gardiner F. THE OLYMPIC ELK. Washington State, Game Bulletin 5(4): 3. Oct. 1953.
Detailed history in western Washington since 1905.--Neil Hotchkiss.

Rognrud, Merle J. THE POPULATION, RANGE, AND PRODUCTIVITY OF THE NORTH NEBO ELK HERD. M. S. thesis, Utah State Agricultural College. 168 p. 1953.

Terwilliger, Charles S., Jr. (Colo. A. & M. Coll.) ANTELOPE: A RANGE ASSET. Colorado Conservation 2(5): 24-25, illus. Sept.-Oct. 1953.
Pronghorns are an asset on cattle ranges because they feed very largely on weeds that are competitors of cattle foods.

Wildhagen, Aage. THE WILD REINDEER IN NORWAY (Aktuelt om villreinen). Papers on Game Research 8: 50-57, maps and graphs. 1952.
Norwegian, English summary. About 250 years ago, wild reindeer were distributed in all arctic and subarctic parts of Norway. Later a decline took place, but now a clear increase can be seen, owing to strong regulation of hunting. Some of the most important factors for the survival of the stocks are discussed. Competition from tame reindeer seems to be responsible for the restricted distribution of wild animals. At least in some areas, the population has reached an optimum density. Shooting more cows there is considered important for keeping the range in good shape. The article contains maps of distribution of wild reindeer and kill statistics.--Teppo Lampio.

MAMMALS--DEER

Berner, Lester M. (S. Dak. Dept. Game.) DEER MANAGEMENT IN THE BLACK HILLS OF SOUTH DAKOTA. [Part I.] South Dakota Conservation Digest 20(11): 8-13, 16, illus. Nov. 1953.
Discussion of history and management problems and detailed account of how the herd and its range are now being studied. Methods tested or settled on for determination of population trend and range-condition trends should be of interest to other workers.

Bramble, W. C., and M. K. Goddard. (Pa. St. Coll.) SEASONAL BROWSING OF WOODY PLANTS BY WHITE-TAILED DEER IN THE RIDGE AND VALLEY SECTION OF CENTRAL PENNSYLVANIA. Journal of Forestry 51(11): 815-819. Nov. 1953.
Report of 5-year study. Authors' summary: "Distinct and consistent preferences were shown by deer so that a table of preferred species could be drawn up for the various seasons of the year. Three types of seasonal pattern were recognized in respect to the vital winter season: (1) species browsed heavily only in the winter, (2) species browsed heavily in other seasons as well as winter, (3) species browsed lightly in the winter. A knowledge of seasonal preferences are needed for proper evaluation of range inventories in any forest region and are basic to management of deer range."

Brazda, A. R. (N. D. Game Dept.) THE 1952 DEER SEASON. North Dakota Outdoors 16(2): 12. Aug. 1953.
Hunting statistics. Total kill was approximately 32,154, of which some 27,000 were whitetails. Remaining brood stock is estimated at 18,000. License sales totalled 42,871 as compared to only 25,603 as recently as 1950.

Champagne, E. Garth. BROWSING DEER DISCOURAGED BY REPELLENT. U. S. Forest Service, Central States Forest Experiment Station (Columbus 15, Ohio), Station Notes no. 80. 2 p. Sept. 1953.
Browsing of evergreens in an Iowa plantation was slight from October through April after 1 heavy treatment with a commercial deer and rabbit repellent. The repellent contained "an amine complex of zinc dimethyl dithiocarbamate with polyethylene polysulfide as an adhesive."

Cheatum, E. L. (N. Y. Cons. Dept.) THE DEER MANAGEMENT PROBLEM IN SOUTHERN NEW YORK. New York State Conservationist 8(1): 22-23, illus. Aug.-Sept. 1953.
Herds of the region are now fairly well controlled; the problem now is to get proper distribution and control of hunting pressure. Three plans for achieving this are presented for consideration.

Gilfillan, Merrill C. THE STORY OF OHIO DEER AND DEER HUNTING. PART I. Ohio Conservation Bulletin 17(8) [sic]: 28. Sept. 1953.
Seasons and hunting statistics, 1943-52. Trend of kill is upward.

Gill, John. (W. Va. Cons. Comm., USDA Bldg., Elkins, W. Va.) REMARKS ON THE ANALYSIS OF KILL-CURVES OF FEMALE DEER. Proc. NE. Section Wildlife Soc., 9th Annual Conf., Bretton Woods, N. H., Sept. 20-23, 1953. 1-12 p., graphs.
Important discussion of variation in and interpretation of kill-curves. Author's summary: "Kill-curves for male deer taken under a buck law can be analyzed by methods similar to those used in analyses of catch curves for fish. Such analyses are usually based on an assumption of stability in the population resulting from 'equal recruitment' and equal mortality. The equal recruitment assumption is seldom acceptable in analyzing kill-curves of female deer. It is suggested that an assumption of recruitment proportional to the population of breeding females be used in most analyses. The slope of a kill-curve of female deer indicates rearing success rather than survival. Survival may be indicated, incidentally, if the curve is derived from a truly stable population. The sources of bias and error affecting age structure data are discussed. A conspicuous bias affecting kill-curves from several states is described. No definite explanation is offered for this bias, but the need for determining its nature is emphasized."

MAMMALS--DEER--Continued

Hall, T. C., E. B. Taft, W. H. Baker, and J. C. Aub. (Mass. Gen. Hospital, Boston.) A PRELIMINARY REPORT ON THE USE OF FLAXEDIL® TO PRODUCE PARALYSIS IN THE WHITE-TAILED DEER (ODOCOILEUS VIRGINIANUS BOREALIS). Journal of Wildlife Management 17(4): 516-520, illus. Oct. 1953.

Authors' summary: "Some experiments are described using paraldehyde, curare and Flaxedil® as paralytic agents in the white-tailed deer. Paraldehyde was used only briefly because it required that the animal be restrained in a chute while it was being administered and because there was a narrow range between the stupefying and lethal doses. Furthermore, complete paralysis was not attained. Curare was a potent paralyzing agent, but the narrow margin of safety rendered it dangerous to use. Neostigmine was of doubtful value as a curare antagonist. Flaxedil® is apparently the agent of choice because of its wide margin of safety, its freedom from undesirable side effects and availability of an effective antagonist, Tensilon®. Flaxedil® is a synthetic compound and therefore inexpensive, easily available and of uniform strength.

Kabat, Cyril, Nicholas E. Collias, and Ralph C. Guettinger. (Wis. Cons. Dept.) SOME WINTER HABITS OF WHITE-TAILED DEER AND THE DEVELOPMENT OF CENSUS METHODS IN THE FLAG YARD OF NORTHERN WISCONSIN. Wisconsin Conservation Department, Technical Wildlife Bulletin no. 7. 1-32 p., illus. 1953.

Report of studies in winter of 1952 at badly over-used yard where feeding with hay and concentrates was done at 11 stations. Twenty-three deer, recognizable by scars and other peculiarities, served as "marked" deer. Most deer moved no more than 0.2 mile within the yard, which contained 3-4 square miles. Largest feeding groups were in hour before sunset. These groups were of mixed sex and age composition. Many fawns were without does. Buck-doe-fawn dominance was apparent on feeding grounds, which may be one reason fawns starve. Deer were more alert and wary than in earlier years, probably because of better health. Apparent scarcity of deer may mean simply that deer are in better shape and warier. About 2% were cripples; most deer crippled by hunting must die within a month or two. Censusing was done by direct counts at feed grounds, by variations of Lincoln Index, by Schnabel's method, and by food consumption. The last 2 gave best results. Population of yard probably was from 900 to 950.

Krefting, Laurits W. (US F&WS.) EFFECT OF CUTTING MOUNTAIN MAPLE ON THE PRODUCTION OF DEER BROWSE. University of Minnesota, Minnesota Forestry Notes no. 21. 2 p. Sept. 1953.

Mountain maple, a preferred deer food of no commercial value, was experimentally cut at ground level to induce sprouting. In following year cut clumps produced twice as much browse as uncut clumps. Sixteen years later cut clumps still were producing much browse although shoot growth had slowed by 50%. Costs of treatment are discussed.

Laughlin, John. (Calif. Dept. Game.) REPORT ON SOUTHERN CALIFORNIA'S JANUARY DEER SEASON. California Fish and Game 39(4): 507-515, illus. Oct. 1953.

An earlier season is prevented by the fire hazard. The January 1953 hunt was reasonably satisfactory.--Neil Hotchkiss.

Lee, James. (N. H. Game Dept.) THE DEER FLY. New York State Conservationist 8(3): 32, illus. Dec.-Jan. 1953-54.

Mechanical deer repellent, The Deer Fly, "is designed to furnish automatic and continuous protection from dusk until morning by emitting at irregular intervals short bursts of sound which tests have proven to be unplesant to deer. The device is small, weighing 1½ pounds...It needs only to be connected to a Hotshot or automobile storage battery to operate. The device is thermostatically controlled, depending upon slight changes in the air temperature for its activation..." It is said to be effective over about 3 acres, depending on conditions. It is sold for about $19 by Wildlife Associates, Inc., Pittsfield, N. H.

MAMMALS--DEER--Continued

Linduska, J. P. (US F&WS.) WHITETAIL DILEMMA. Hunting and Fishing 30(10): 18-19, 31-35, illus. Oct. 1953.
Convincing, factual, popular article that tells of the rise of our deer herds and why herds must be controlled. It clearly points out that deer of many areas are ruining forests, starving by the thousands, and going to waste. Where game authorities are allowed to set realistic regulations, often permitting any-deer shooting, deer foods and forest reproduction are increasing, the deer harvest is far greater, herds are thriving, deer are larger, antlers are better, and more fawns are born and survive.

Michigan. 1952 DEER HUNTING INFORMATION AND 1953 DEER HUNTING REGULATIONS. Michigan Department of Conservation. 4 unnumbered p. No date. [1953.]
Detailed tabulations of 1952 kill, discussion of that season, and regulations for 1953. Figures were obtained through statistically reliable post-card poll of 2.5% of gun hunters and 10.5% of bow hunters. It is interesting to note that the kill during the regular 2-week buck season was only 51,730 for the whole state, but the kill during the 3-day any-deer season (Northern Lower Peninsula only) was more than twice as large--110,390. With this population reduction in trouble areas, and a mild winter, there was practically no winter loss. It is believed that the 1953 fawn crop has nearly replaced the hunter take. Nevertheless, the any-deer season for 1953 will be for only 1 day.

Richards, E. V. (Va. Game Comm.) HIGHLIGHTS OF VIRGINIA'S 1952 DEER STUDY. Virginia Wildlife 14(10): 18-19, 22, illus. Oct. 1953.
General discussion of deer and deer harvest in state, with data on weights and condition in different portions of state.

Robb, Dunbar. THE END OF THE BEGINNING. Missouri Conservationist 14(10): 5-6, 14, illus. Oct. 1953.
Since 1937 whitetail deer breeding stock has been released in all suitable parts of Missouri. As a result, hunting became possible in 1944 and an any-deer season in 1951.--Neil Hotchkiss.

Silver, James. (US F&WS.) KEY DEER GET ANOTHER STAY OF EXECUTION. U. S. Fish and Wildlife Service, Atlanta 5, Georgia. Third Progress Report. 2 p. Aug. 1953.
Congress has permitted the Fish and Wildlife Service to lease lands for key deer management. This will facilitate minor habitat restoration but is only a stop-gap, for owners can cancel leases at any time other use is more profitable. A permanent refuge is much needed. Deer are in good shape and have increased to about 90 or 100. Food is plentiful and could carry at least 250 deer. Water developments are needed on some islands.

Stevens, Clark L. (U. of N. H.) USE OF CHECKING STATION DATA IN DETERMINING THE SIZE OF THE NEW HAMPSHIRE DEER HERD. Proc. NE. Section Wildlife Soc., 9th Annual Conf., Bretton Woods, N. H., Sept. 20-23, 1953. 5 unnumbered p., graph.
The minimum size of the herd at different times can be estimated from kill-curve of age classes and data on sex ratio and reproductive rate. Figures on N. H. deer are used to illustrate the procedure. Variation from normal kill-curve may indicate success or failure of a given age group, as loss of fawns in a hard winter.

Thomas, D. Woods, and Jerome K. Pasto. (Pa. St. Coll.) A THEORETICAL FRAMEWORK FOR UNDERSTANDING THE DEER MANAGEMENT PROBLEM. Proc. NE. Section Wildlife Soc., 9th Annual Conf., Bretton Woods, N. H., Sept. 20-23, 1953. 1-5 p., graphs.
Rather elaborate theoretical analysis of obvious facts about conflict of interest between landowners and hunters.

MAMMALS--MARINE

Aretas, Raymond. L'ÉLÉPHANT DE MER (MIROUNGA LEONINA (L.)): ETUDE BIOLOGIQUE DE L'ESPÈCE DANS LES POSSESSIONS FRANCAISES AUSTRALES (ARCHIPEL DES KERGUELEN). Mammalia 15(4): 105-17, illus. 1951. [From Polar Record 6(46).]

Bartholomew, George A., Jr., and Paul G. Hoel. (U. Calif. at Los Angeles.) REPRODUCTIVE BEHAVIOR OF THE ALASKA FUR SEAL, CALLORHINUS URSINUS. Journal of Mammalogy 34(4): 417-436, illus. Nov. 1953.
"The present study attempts, by means of direct observations, a mathematical model, and statistical analyses, to determine the time relations of various aspects of reproduction...and to describe both quantitatively and qualitatively certain features of the social structure and breeding behavior of this species." Behavior on the breeding ground is analyzed in detail. One conclusion is that present management of the herd does not prevent a satisfactory pregnancy rate.

Carrara, Italo Santiago. LOBOS MARINOS, PINGUINOS Y GUANERAS DE LAS COSTAS DEL LITORAL MARITIMO E ISLAS ADYACENTES DE LA REPUBLIC ARGENTINA. La Plata, Universidad Nacional. iv + 110 p., illus. 1952. [From Polar Record 6(46).]
"Seals, penguins and sea-bird colonies along coasts of Argentina; sealing industry; exploitation of guano deposits."

Davies, J. L. (County Planning Dept., Winchester, Eng.) COLONY SIZE AND REPRODUCTION IN THE GREY SEAL. Proceedings of the Zoological Society of London 123(2): 327-332, map. Aug. 1953.
"It is concluded that the smaller colonies cannot maintain themselves unaided and that their numbers must be augmented from larger colonies where the reproductive rate is much higher."

Dunbar, M. J. (McGill U.) ARCTIC AND SUBARCTIC MARINE ECOLOGY: IMMEDIATE PROBLEMS. Arctic 6(2): 75-90, illus. July 1953.
Discusses many marine problems, including those pertaining to mammals. Decimation and conservation of whales and seals are considered, and research needs for seals are outlined.

Kenyon, Karl W., and Victor B. Scheffer. THE SEALS, SEA-LIONS, AND SEA OTTER OF THE PACIFIC COAST / INFORMATION WITH DRAWINGS TO AID IN FIELD IDENTIFICATION. U. S. Fish and Wildlife Service, Wildlife Leaflet 344. 1-28 p., illus. Feb. 1953. [Never given general distribution and NOT available from D. C. office. A few copies remain for distribution from US F&WS, 2725 Montlake Blvd., Seattle 2, Wash.]
Attractive processed booklet with drawings, photographs, and information on identification, range, habits, foods, and economic status of the 6 species involved. It is relatively brief and nontechnical, intended chiefly for use by laymen.

Laws, R. M. (Falkland Islands Dependencies Survey, Grytviken, So. Georgia.) THE ELEPHANT SEAL INDUSTRY AT SOUTH GEORGIA. Polar Record 6(46): 746-754, illus. July 1953.
Description of exploitation and management of this oil resource. Further harvest controls are recommended.

Marsden, Robert. ELECTRICAL METHOD OF KILLING WHALES. World Fishing 1(3): 97-100. 1(4): 127-133, illus. 1952. [From Polar Record 6(46).]
"Experiments by United Whalers Ltd. in Antarctic, 1949-50."

Matthews, L. Harrison. SEA ELEPHANT: THE LIFE AND DEATH OF THE ELEPHANT SEAL; ILLUSTRATED BY THE AUTHOR. Macgibbon and Kee, London. 190 p., illus. 1952. 15s. [From Polar Record 6(46).]
"Mirounga leonina at South Georgia, 1924-28."

MAMMALS--MARINE--Continued

Mead, Giles Willis, Jr. THE FOOD HABITS OF THE NORTH PACIFIC FUR SEAL IN JAPANESE WATERS, WITH A STUDY OF THE FISHES FOUND ON THE FEEDING GROUNDS. PhD thesis, Stanford University. 141 p. 1953.
Based on contents of 2,312 seal stomachs and on fishes collected by trawling. Evidence suggested that most feeding is done at night. One commercially important fish (Ommastrephes sloani) constituted 22% of the diet, but other foods were of little economic importance.

Mizue, Kazuhiro, and Hisako Jimbo. STATISTIC STUDY OF FOETUSES OF WHALES. Scientific Reports of the Whales Research Institute (Tokyo), no. 3. 119-131 p., illus. 1950. [From Polar Record 6(46).]
"Chiefly Balaenopteridae and Physeteridae. Based on Japanese reports, 1911-48."

Mohr, Erna. BEITRAGE ZUR KENNTNIS DER MAHNENROBBEN. Zoologische Garten, N.F. Bd. 19, Heft 2/4. 98-112 p., illus. 1952. [From Polar Record 6(46).]
"Study of Falkland Sea Lion...and Steller's Sea Lion...; based on literature and observations in zoological gardens."

Nishiwaki, Masaharu. DETERMINATION OF THE AGE OF ANTARCTIC BLUE AND FIN WHALES BY THE COLOUR CHANGES IN CRYSTALLINE LENS. Scientific Reports of the Whales Research Institute (Tokyo), no. 4. 115-161 p., illus. 1950. [From Polar Record 6(46).]
"Observations on eyes of Balaenopteridae, 1948-49."

Nishiwaki, Masaharu. ON THE BODY WEIGHT OF WHALES. Scientific Reports of the Whales Research Institute (Tokyo), no. 4. 184-209 p., illus. 1950. [From Polar Record 6(46).]
"Measurements of 32 Blue Whales and 29 Fin Whales, 1947-48 and 1948-49."

Nishiwaki, Masaharu. ON THE AGE-DETERMINATION OF MYSTACOCETI, CHIEFLY BLUE AND FIN WHALES. Scientific Reports of the Whales Research Institute (Tokyo), no. 7. 87-119 p. 1952. [From Polar Record 6(46).]
"Results of observations during 4 antarctic whaling seasons 1946-50. Statistics of catch."

Nishiwaki, Masaharu, and Takashi Hibiya. ON THE SEXUAL MATURITY OF THE SPERM WHALE (PHYSETER CATODON) FOUND IN THE ADJACENT WATERS OF JAPAN. II. Sci. Rept. Whales Research Inst., Tokyo, no. 7. 121-124 p., illus. July 1952.

Ohino, Mizuho, and Kazuo Fujino. BIOLOGICAL INVESTIGATION ON THE WHALES CAUGHT BY THE JAPANESE ANTARCTIC WHALING FLEETS, SEASON 1950-1951. Sci. Repts. Whales Research Inst., Tokyo, no. 7. 125-188 p., illus. July 1952. [From Journal of Mammalogy 34(3).]

Ruud, Johan T. MODERN WHALING AND ITS PROSPECTS. Fisheries Bull. Food & Agric. Organization United Nations, Rome, 5(5): 165-183. Sept.-Oct 1952. (Reprinted in: Norsk Hvalfangst Tidende (Norwegian Whaling Gazette), Sandefjord, 41(12): 649-662. Dec. 1952.) [From Journal of Mammalogy 34(3).]

Scheffer, Victor B. (Colo. A. & M. Coll.) MEASUREMENTS AND STOMACH CONTENTS OF ELEVEN DELPHINIDS FROM THE NORTHEAST PACIFIC. Murrelet 34(2): 27-30, illus. May-Aug. 1953.
Nine porpoises and 2 dolphins.

Stephenson, W. THE LESSER RORQUAL IN BRITISH WATERS. Rep. Dove Mar. Lab. (3): 12(1949): 7-48. 1951. [From Journal of Animal Ecology 22(2).]
Summary of knowledge of Balaenoptera acutorostrata: seasonal occurrence, time of birth, size groups, ages, foods, parasites.

MAMMALS--MARINE--Continued

Wilke, Ford. (US F&WS, Seattle 2, Wash.) PELAGIC FUR SEAL RESEARCH OFF JAPAN IN 1950. U. S. Fish and Wildlife Service, Leaflet WL - 338. 1-35 p., illus. Jan. 1952.
Reproduction of Preliminary Study 67, Oct. 1951, of Natural Resources Section, General Headquarters, Supreme Commander for the Allied Powers, Tokyo. See WR 73:52.

Wilke, Ford, Takeshi Taniwaki, and Nagahisa Kuroda. (US F&WS, 2725 Montlake Blvd., Seattle 2, Wash.) PHOCOENOIDES AND LAGENORHYNCHUS IN JAPAN, WITH NOTES ON HUNTING. Journal of Mammalogy 34(4): 488-497, illus. Nov. 1953.
Commercial hunting gave much opportunity for study. This paper discusses hunting, utilization, measurements, ranges, systematic status of True porpoise (apparently distinct from Dall porpoise), and foods.

MAMMALS--OTHER GROUPS

Pearson, Oliver P., and Paul H. Baldwin. (U. Calif. at Berkeley.) REPRODUCTION AND AGE STRUCTURE OF A MONGOOSE POPULATION IN HAWAII. Journal of Mammalogy 34(4): 436-447, illus. Nov. 1953.
Relative ages of 221 mongooses collected throughout year were determined from characters of skull and teeth. Mean age of males was 25 months; of females, 22 months. Young were inadequately represented in sample. Reproductive anatomy and sexual cycle are described for both sexes. They resemble those of the ferret and are perhaps primitive. Females may mate at 9 months of age and may bear 2 litters per year. Number of young per litter, as judged from fetuses, placental scars, and corpora lutea, varies from 1 to 4, averaging between 2 and 3.

Sandidge, Lewis L. (U. Kans.) FOOD AND DENS OF THE OPOSSUM (DIDELPHIS VIRGINIANA) IN NORTHEASTERN KANSAS. Transactions of the Kansas Academy of Science 56(1): 97-106. 1953.
Food habits of 62 specimens collected in fall and winter; types and abundance of dens; sex ratios in several samples (average 53.9% males); ecto- and endoparasites; economic importance. Insects, especially grasshoppers, were the chief food, but mammals and fruits were also important. Only 4 wild birds had been eaten. Chicken occurred 9 times but was considered carrion. Preferred habitat was mixed woodlands, particularly along small streams. Dens were numerous, 60 being found in 3.3 acres, and were not considered a limiting factor. Opossums are the most abundant furbearers in Kansas; they provide "substantial incomes" to trappers in favorable localities despite extremely low pelt prices (35¢ in 1948-49), because they are so easily caught and prepared.

Schwartz, Charles and Elizabeth. (Mo. Cons. Comm.) OPOSSUM. Missouri Conservationist 14(7): 11-13, illus. July 1953.
First of a series on Missouri mammals. Good, well illustrated review of habits and biology of the opossum. The treatment is considerably more detailed and informative than is usual in popular accounts, and of course the drawings by the senior author add notably to interest and value of the series. A range map is another good feature.

BIRDS--GENERAL

Amadon, Dean. (Amer. Mus. Nat. Hist., N. Y.) MIGRATORY BIRDS OF RELICT DISTRIBUTION: SOME INFERENCES. Auk 70(4): 461-468. Oct. 1953.

Bond, Gorman M., editor. SEVENTEENTH BREEDING-BIRD CENSUS. Audubon Field Notes 7(6): 335-360, illus. Dec. 1953.
Contains reports of 44 censuses made in many parts of North America. Numerous habitats were studied, but 81% of censuses were made in forests of various types. All reports are quantitative.

BIRDS--GENERAL--Continued

Cade, Tom J. (U. Calif. at L. A.) A SYNOPTIC BIBLIOGRAPHY OF ALASKAN ORNITHOLOGY. Department of Zoology, University of California, Los Angeles. iv + 76 p. Duplicator process. Revised Sept. 1953.
Some 750 titles are listed. Titles are annotated, and rather detailed abstracts are given for some. The arrangement is by year, and by author under year. A limited number of copies of this bibliography are available on request to author.

Cott, Hugh B. (Cambridge U., Eng.) THE EXPLOITATION OF WILD BIRDS FOR THEIR EGGS. Ibis 95(3): 409-449. July 1953.
Important compilation of facts and figures about past and present, wise and unwise, exploitation of these eggs. Treatment is first by geographic region, then by species.

Dowden, Philip B., H. A. Jaynes, and V. M. Carolin. (U. S. Bur. Ent. & Pl. Quar.) THE ROLE OF BIRDS IN A SPRUCE BUDWORM OUTBREAK IN MAINE. Journal of Economic Entomology 46(2): 307-312. April 1953.
By caging infested trees to exclude birds, and by shooting birds from 1 area and leaving them unmolested in 2 check areas, it was ascertained that birds consumed between 100 and 300 budworms per tree in a 4-week period, which represents a very small proportion of the budworm population.--R. T. Mitchell.

Hann, Harry W. (U. Mich.) THE BIOLOGY OF BIRDS. Edwards Bros., Ann Arbor, Mich. 153 p., illus. 1953. $2.72. [From review by M. M. Nice, Bird-Banding 24(4).]
"A condensed survey, embodying results of many of the latest researches. Fifteen main topics are treated, such as morphology and physiology, flight, migration and homing, breeding cycle, longevity, distribution, conservation, etc. There are nine plates...a 12 page bibliography, and a detailed index. The author attempts to cover a vast field...he has presented a useful compendium of much up-to-date information."

Hickey, Joseph J. A GUIDE TO BIRD WATCHING. Garden City Books, N. Y. First published 1943, reprinted 1953. $1.98. [From review by Wendell Taber, Bird-Banding 24(4).]
Reissue of this valuable and interesting guide to the field study of birds. "Throughout, the author emphasizes the innumerable opportunities for constructive work and gives appropriate references to the literature listed in the appendix."

Pettingill, Olin Sewall, Jr. A GUIDE TO BIRD FINDING WEST OF THE MISSISSIPPI. Oxford University Press, N. Y. xxiv + 709 p., illus. 1953. $6.00.
Needs no introduction to those who know the author's earlier volume on the East. Thick but pocket size (5 x 7½ in.), this volume tells exactly how to reach the best birding areas of the West, what the places are like, and what unusual birds you will find in them. Public areas such as national parks and refuges are emphasized. Treatment is by states, and for each state the author lists his collaborators, many of them famous ornithologists. The 56-page index lists both birds and localities. Even naturalists who are not ornithologists should find the book a useful traveling companion if they wish to visit interesting, natural areas.

Saunders, Aretas A. THE LIVES OF WILD BIRDS. Doubleday & Co., Garden City, N. Y. 256 p., illus. 1954. $3.50.
Intended chiefly as a guide to field study of birds, but contains much natural history information on many topics. Chapters treat field identification, record keeping, migration, nesting cycle, nests, behavior, plumage, voices, foods, ecology, and conservation. Any beginner who studies the book will have a knowledge of various approaches to bird study and will be warned of many pitfalls. He will also gain a general knowledge of field biology, and will be far ahead of the average bird watcher. The text is rather elementary as is natural in an introductory work. Less natural is the lack of attention to modern work on behavior, population dynamics, and certain other subjects. The author's

BIRDS--GENERAL--Continued

opinions, which are freely expressed, are sometimes controversial, and the chapter on conservation contains several questionable statements or points of view. On the whole, the book seems to represent its author's knowledge and experience more than the total of present day knowledge.

Terres, John K. (Nat. Aud. Soc.) SONGBIRDS IN YOUR GARDEN. Thomas Y. Crowell Co., N. Y. xiv + 274 p., illus. 1953. $3.95.
Interestingly written and with an abundance of illustrative anecdotes, this book also is practical, scientific, and based on a wealth of experience. It is perhaps the most valuable book for anyone who wishes to attract birds. A better, more readable book on the subject would be hard to imagine, and even harder to write. Chapters treat foods and feeding, birdhouses, how to help at nesting time, drinking and bathing water, care of young birds, attracting hummingbirds, ornamental plantings for birds, making sounds to attract birds, and some problems and how to meet them. The appendix lists seasonal needs of birds, plants especially attractive to given avian species in different regions of the U. S., types of foods particular kinds of birds will eat, nesting records for some garden birds, other tables, and references.--James V. Derby.

Young, Duane Eugene. ECOLOGICAL CONSIDERATIONS IN THE EXTINCTION OF THE PASSENGER PIGEON (ECTOPISTES MIGRATORIUS), HEATH HEN (TYMPANUCHUS CUPIDO CUPIDO) AND THE ESKIMO CURLEW (NUMENIUS BOREALIS). PhD thesis, University of Michigan. 541 p. 1953. [From Dissertation Abstracts 13(5).]
Analysis of factors contributing to extinction, with notes on certain remaining forms now endangered.

BIRDS--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION

Bailey, Robert E. (U. Calif. at Berkeley.) SURGERY FOR SEXING AND OBSERVING GONAD CONDITION IN BIRDS. Auk 70(4): 497-499, illus. Oct. 1953.
Describes anesthesia and surgical techniques by which birds, even small ones, may be examined internally. Mortality has been less than 1%. The same bird may be opened repeatedly.

Barth, Edvard K. INCUBATION PERIOD AND LOSS OF WEIGHT OF EGGS OF THE COMMON GULL, LARUS CANUS CANUS, AND OF THE LESSER BLACK-BACKED GULL, L. FUSCUS INTERMEDIUS. Papers on Game Research 8: 111-121, graph. 1952.

Breland, Osmond P. (U. Texas.) BIRD RECORDS--GREAT AND SMALL. Audubon Magazine 55(4): 170-171, illus. July-Aug. 1953.
Consists of the following short sections: How fast can birds fly? The sizes of birds. The proportions of birds. The sizes of birds' eggs. The incubation period of birds' eggs. How long do birds live?

Farner, Donald S., L. R. Mewaldt, and Stanley D. Irving. (St. Coll. Wash.) THE ROLES OF DARKNESS AND LIGHT IN THE ACTIVATION OF AVIAN GONADS. Science 118(3065): 351-352. Sept. 25, 1953.

Guhl, A. M., and L. L. Ortman. (Kans. St. Coll.) VISUAL PATTERNS IN THE RECOGNITION OF INDIVIDUALS AMONG CHICKENS. Condor 55(6): 287-298, illus. Nov.-Dec. 1953.
Dominance relations were altered by changing appearance of individuals.

Hinde, R. A. THE BEHAVIOR OF THE GREAT TIT (PARUS MAJOR) AND SOME OTHER RELATED SPECIES. Behavior, Suppl. 2. 210 p., illus. 1952. [From review by M. M. W., Ibis 95(1).]
"This is a very important paper, a brilliant example of comparative ethology carried out according to the objective method...a milestone in ornithological science as the first completely modern study of a species and its genus."

BIRDS--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION--Continued

Howard, Len. BIRDS AS INDIVIDUALS. Doubleday and Co., Garden City, N. Y. 219 p., illus. 1953. $4.00.

This is a fascinating and challenging book, one whose possible importance is such that Julian Huxley and Roger Tory Peterson have written foreword and introduction. Miss Howard, a professional musician, not only studies the birds of her Sussex garden--she lives with them, birds coming and going from her rooms as they please. She knows traits and characters of individuals as few people know those of their house pets. Although her birds are not banded, she is confident that she recognizes the same individuals for as long as several years, and that she even knows the genealogy of some of them for 2 or 3 generations. So persuasive and factual is she that the reader has difficulty in remaining critical. The great point she makes with her bird biographies is that birds have far more intelligence and adaptability than most workers think, and that they vary far more in character and personality than is usually believed. The great titmouse, in particular, seems to be as clever and flexible in behavior as a dog. Even examples of altruism were noted. Those who view birds as governed only (or even mainly) by instinct certainly should read the book. It would be interesting to compare this book with that of Hinde, which is listed on page 50. The last 46 pages of Howard's book are devoted to a technical analysis of songs of British birds, but the rest of the volume is easy and interesting reading.

Matthews, G. V. T. THE RELATION OF LEARNING AND MEMORY TO THE ORIENTATION AND HOMING OF PIGEONS. Behavior 4: 202-221. 1952. [From Ibis 95(1).]

Matthews, G. V. T. (U. Cambridge, Eng.) SUN NAVIGATION IN HOMING PIGEONS. Journal of Experimental Biology 30(2): 243-267, diagrams. June 1953.

From author's summary: "2. Bico-ordinate navigation can only be demonstrated in sunny conditions, and with overcast skies the birds scatter at random. This holds for a number of different experimental situations. 3. The hypothesis that pigeons use a form of sun-navigation, deriving latitude and longitude from the sun position alone is re-examined in detail. None of the requirements are outside the theoretical range of the organ concerned, or beyond the bounds of possibility... 7. After treatment aimed at desynchronizing any internal chronometer a disorientation was obtained in the field. It is therefore very probable that longitude determination is on a time basis, as proposed in the hypothesis."

Matthews, G. V. T. (U. Cambridge, Eng.) THE ORIENTATION OF UNTRAINED PIGEONS: A DICHOTOMY IN THE HOMING PROCESS. Journal of Experimental Biology 30(2): 268-276, diagrams. June 1953.

From author's summary: "1. It is demonstrated that young pigeons without any previous training show a definite homeward orientation at a distance, yet home very badly. 2. The results are compared with those of birds with varying amounts of training. An essential dichotomy in the homing process is revealed, between the orientation process which is innate and the process of return which is governed by factors developed by individual experience..."

Matthews, G. V. T. (U. Cambridge, Eng.) NAVIGATION IN THE MANX SHEARWATER. Journal of Experimental Biology 30(3): 370-396, maps and graphs. Sept. 1953.

Detailed account of experiments. "For the first time we have a demonstration of complete evidence for navigational ability in a wild bird. The suggestion of a form of sun navigation is in line with evidence obtained with pigeons and gulls. ...The sun-navigation hypothesis is investigated. Although shearwaters fly to the burrows after dark they are unable to navigate after sundown."

Musacchia, X. J. (St. Louis U.) A STUDY OF THE LIPIDS IN ARCTIC MIGRATORY BIRDS. Condor 55(6): 305-312. Nov.-Dec. 1953.

"The suggestion is made that a high level of lipid metabolism is related to the increased storage of fat associated with periods of migration."

BIRDS--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION--Continued

Skutch, Alexander F. HOW THE MALE BIRD DISCOVERS THE NESTLINGS. Ibis 95(1): 1-37, Jan. 1953; 95(3): 505-542, July 1953.
Detailed species accounts.

BIRDS--MANUALS, FAUNAS, COMMUNITIES

Drury, William H., Jr. (Harvard U.) BIRDS OF THE SAINT ELIAS QUADRANGLE IN THE SOUTHWESTERN YUKON TERRITORY. Canadian Field-Naturalist 67(3): 103-128, maps. July-Sept. 1953.
Based on study from June 1 to Sept. 9, 1948. Birds are discussed in relation to plant and habitat types, and an annotated list of birds is provided. One section is "Geographical Affinities of the Bird Species."

Jewett, S. G., W. P. Taylor, W. T. Shaw, and J. W. Aldrich. BIRDS OF WASHINGTON STATE. University of Washington Press. xxxii + 768 p., 12 color plates, 99 photographs, 51 maps of breeding distribution, and life zone map (in endpocket). 1953. $8.00.
This handsome volume, printed on glossy paper, is based on an enormous amount of work. The book contains description of state and its life zones, species and subspecies accounts, annotated hypothetical list, gazetteer, bibliography, and index. The bibliography occupies 41 pages. Species accounts include paragraphs on status, description, and distribution. These usually are followed by several paragraphs telling of observations made in the state on habitats, breeding, foods, or other life history topics. Complete life histories, however, are not attempted. Nest and eggs are discussed briefly under "Description," and extreme migration dates are listed under "Distribution." Occasional taxonomic notes are given. The volume is not intended as a handbook or manual, but it should be of high reference value to ornithologists in the Northwest.

Lancum, F. Howard. WILD BIRDS AND THE LAND. London, Her Majesty's Stationery Office. Ministry of Agriculture and Fisheries Bulletin no. 140. 1-76 p., illus. 1948. Reprinted each year through 1952. 3s.
An attractive booklet on British birds, beautifully illustrated with black and white photographs. The popularly written text takes up the commoner or more important birds species by species, giving brief descriptions and natural history information. More important, it gives a sane and balanced economic appraisal of each of these birds.

Salt, George William. (U. Calif., Davis.) AN ECOLOGIC ANALYSIS OF THREE CALIFORNIA AVIFAUNAS. Condor 55(5): 258-273, diagrams. Sept.-Oct. 1953.
"A method is described for classifying the avifauna of a locality into nine categories on the basis of location of the feeding site within the strata of the vegetation and the type of food taken. A diagram of horizontal bars on a vertical axis is used to graph the results of such classification." Examples are given and results are discussed.

BIRDS--PARASITES AND DISEASES

Levine, Norman D. (U. Ill.) A REVIEW OF THE COCCIDIA FROM THE AVIAN ORDERS GALLIFORMES, ANSERIFORMES AND CHARADRIIFORMES, WITH DESCRIPTIONS OF THREE NEW SPECIES. American Midland Naturalist 49(3): 696-719, illus. May 1953.

Sciple, George W. (US F&WS, Denver 2, Colo.) AVIAN BOTULISM: INFORMATION ON EARLIER RESEARCH. U. S. Fish and Wildlife Service, Special Scientific Report: Wildlife no. 23. 1-12 p. Aug. 1953.
Concise summary of knowledge of this waterfowl disease. Unsolved problems are also discussed. Thirty-three references.

BIRDS--UPLAND GAME--GENERAL

Madsen, Holger. ON PARASITISM IN GALLINACEOUS BIRDS (Über Parasitose jagdbarer Hühnervögel). Papers on Game Research 8: 154-158. 1952.
In German. Parasites found in gallinaceous birds in Denmark. Several new host records. Frequency of occurrence is given in a table. After research and survey of literature, the author concluded that among helminths only nematodes and among protozoans only coccidia and haemosporidia have any importance. In Denmark there have been no epidemics caused by parasites in wild birds. In captive birds, however, the situation is different.--Teppo Lampio.

BIRDS--QUAIL

Hamrum, Charles L. (Gustavus Adolphus Coll.) EXPERIMENTS ON THE SENSES OF TASTE AND SMELL IN THE BOB-WHITE QUAIL (COLINUS VIRGINIANUS VIRGINIANUS). American Midland Naturalist 49(3): 872-877. May 1953.
Author's summary: "Bob-white quail can be trained to associate the odor of coumarin with food. The bob-white is a difficult animal to train to respond to an odor; possibly odor is an unfamiliar stimulus, or perhaps the bob-white would be difficult to train to any sensory cue. When coumarin is added to the food of the quail, food consumption is markedly reduced. The birds were offered daily a choice between a test solution and water. Five metallic chlorides, HCl and sucrose were used for the test solutions. The cations as chlorides were rejected by the quail in the following order: $Na^{+} < Ca^{++} < K^{+} < NH_4^{+} \leq Li^{+}$. This order is similar to that reported previously for other animals, except for Li^{+}. HCl was accepted in concentrations as high as 0.4 N. Sucrose solutions are readily accepted and even preferred over water by the bob-white. These experiments indicate that both the odor and taste of a food probably influence the food choice of this animal."

Parmalee, Paul W. (Ill. St. Mus., Springfield.) FOOD AND COVER RELATIONSHIPS OF THE BOBWHITE QUAIL IN EAST-CENTRAL TEXAS. Ecology 34(4): 758-770. Oct. 1953.
Discussion of ecology of post oak region as it concerns quail, seasonal food habits of quail, and food habits of song birds and rodents that may be competitors of quail. Most important quail foods were seeds of Croton and Quercus. Songbirds were not serious competitors except that traveling flocks of doves and grackles sometimes stripped much food from an area. Small rodents of several species seemed to be more important competitors, eating and storing large amounts of seeds of types eaten by quail.

Stanford, Jack A. (Mo. Cons. Comm.) POOR LITTLE ROBERT--OR BOBWHITE QUAIL AND DROUGHT IN MISSOURI 1953. Missouri Conservationist 14(11): 1-7, illus. Nov. 1953.
Drought struck hard in Missouri in 1952 and 1953. Quail populations suffered in many ways. Many hens deserted nests. Many renesting efforts were necessary, and late clutches are always small. Large numbers of eggs were killed by heat. In some nests, ground heat caused a few eggs to hatch early, and hens left with these chicks, abandoning the rest of the eggs. Some hens died on the nest and were found to have been worn down to half their weight by repeated efforts to reproduce. Loss of cover and tendency to gather in moist areas probably exposed quail to unusual predation. In 1952 the percentage of young and hunter success both dropped (data given by regions of state in tables). Field conditions in 1953 were even worse and quail hunting prospects were poor. Bag and season limits were reduced. Even with years of normal rainfall, it will take the quail population 2-3 years to recover.

BIRDS--QUAIL--Continued

Stanford, Jack A. (Mo. Cons. Comm.) QUAIL DO HAVE SECOND BROODS. Missouri Conservationist 14(12): 4-6, 12, illus. Dec. 1953.
Proof that bobwhites in Missouri sometimes produce 2 broods a season. The hen renests when the first young are 13-15 days old, leaving the first brood to the care of the cock. When the second brood hatches, the parents join in care of the mixed brood. The phenomenon is rare enough to be of practically no production importance.

BIRDS--PHEASANTS

Allen, Durward L. (US F&WS.) PHEASANTS AFIELD. Stackpole Co., Harrisburg, Pa. 128 p., illus. 1953. $1.00.
This is the research man's story of pheasant management in North America. It reviews most of the top research on the ringneck and relates current practices to what has been learned. To the nontechnical reader it may seem pessimistic, since it points up the futility of such management practices as the game farm, winter feeding, the pheasant refuge, predator control, closely restrictive protection, and even widespread habitat improvement as it is now done. In contrast, however, the careful reader will get the impression that pheasant management, although difficult, is not impossible. The same method that has exposed flaws in the old order is called on to advance the program. The book seems to be an unbiased attempt to apply facts to the major problems of pheasant management. It should be included in the library of the serious game manager as well as that of the intelligent hunter.--Fred Dale.

Anonymous. PHEASANTS, FARMS, AND THE FUTURE. Washington State, Game Bulletin 5(4): 6-7, illus. Oct. 1953.
A program for eastern Washington.--Neil Hotchkiss.

Blouch, Ralph I., and L. L. Eberhardt. (Mich. Dept. Cons.) SOME HATCHING CURVES FROM DIFFERENT AREAS OF MICHIGAN'S PHEASANT RANGE. Journal of Wildlife Management 17(4): 477-482, map and graphs. Oct. 1953.
See WR 73:61.

Carlson, Pershing. (N. D. Game Dept.) PHEASANT NESTING STUDY. North Dakota Outdoors 16(2): 7, 15. Aug. 1953.
Work by Robert J. Fischer in southwestern North Dakota revealed that only 5 of 123 nests escaped destruction or abandonment. Predators destroyed 81, late snow and heavy rain forced abandonment of 24, farming destroyed 12, and a horse 1. Thirty-eight nest losses were attributed to skunks, 14 to badgers, 7 to squirrels or weasels, 5 to crows, 1 to cat, 16 to unidentified predators. All nests were in good pheasant habitat. They were inspected almost daily. It is believed that "farming conditions have resulted in crowding nesting birds into less area, thus making it more possible for predators to locate nests. At the same time, due to low fur prices, predator populations are high." The department is emphasizing game-predator relationships; officials who disagreed with this policy have resigned.

Davis, Bob. (Ohio Dept. Nat. Resources.) IS WINTER FEEDING WORTH THE COST? Ohio Conservation Bulletin 17(12): 11, illus. Dec. 1953.
Figures that are given show that it would cost $61,881, or about $1 per bird, to feed the pheasants of Henry Co., Ohio, for 18 weeks of winter.

Greeley, Frederick, and Roland K. Meyer. (U. Wis.) SEASONAL VARIATION IN TESTIS-STIMULATING ACTIVITY OF MALE PHEASANT PITUITARY GLANDS. Auk 70(3): 350-358, graph. July 1953.

Leach, Howard R., Carol M. Ferrel, and Ernest E. Clark. (Calif. Dept. Game.) A STUDY OF THE FOOD HABITS OF THE RING-NECKED PHEASANT ON IRRIGATED PASTURE IN CALIFORNIA. California Fish and Game 39(4): 517-525, illus. Oct. 1953.
Based on 101 pheasants collected every month of the year in Stanislaus

BIRDS--PHEASANTS--Continued

Co. Ladino clover leafage was a staple in every month and made up 27.6% of the diet. Weed seeds constituted 66.9% of all food. Apparently enough weed seeds are present the year round. With high nesting success and low hunting pressure, pheasants are quite successful in the area.

Ledin, Donald H., and Gerald T. Bue. (Minn. Div. Game.) PHEASANT POPULATION TRENDS. Conservation Volunteer 16(95): 8-11. Sept.-Oct. 1953.
Based on studies in 6 townships of Minnesota's best pheasant range. Dispersion of hunters was better than expected, with 47-128 acres per hunter. About 70% of season's kill was in first week end. Postseason censuses of 2 counties were 67% and 59% lower in March than in January. If such winter losses are usual, heavier fall harvests would be desirable. Of game-farm pheasants released in July, only 14.6% were bagged. Most of these birds (72%) moved less than 1 mile from release point. Only 2% moved 3-5 miles, but 1 traveled 85 miles.

Robbins, Russell. (Iowa St. Coll.) PERSISTENCE--THE 1953 HEN PHEASANT. Iowa Conservationist 12(11): 179, illus. Nov. 1953.
Results of observation of 104 nests on Winnebago Pheasant Research Area, Iowa. There were few sites for nesting except in fencerows, but these are travel lanes for predators and are well watched by crows. Of 14 nests in fencerows, only 1 hatched. Some hens nested in hayfields; here more than 1/3 of the estimated nesting population was killed or injured by mowing. Only 6 of 56 nests in hayfields hatched before mowing. Hens that nested in oat fields did better, with 15 of 27 nests hatching before mowing.

Sharp, Ward M. (Pa. St. Coll.) A REVALUATION OF PLANT COMMUNITIES WITHIN THE PHEASANT RANGE IN THE NEBRASKA SANDHILLS. Ecology 34(4): 771-777. Oct. 1953.
Drought of the 1930's dried up marshes and caused weedy forbs to replace grasses. These changes were unfavorable to cattle, but encouraged peak pheasant populations. Wet years following 1941 filled marshes and lakes with water and caused dominance of grasses. Pheasants declined and remained low. Hard winters killed many pheasants in the dry period without lasting population effect, but did have lasting effect in the wet period. These observations on the result of climatic changes on pheasants are believed applicable to much of the Great Plains. The unfavorable effects of intensified agriculture are also stressed.

Westerskov, Kaj. (Wildlife Div., Wellington, N. Z.) PHEASANT BANDING IN NEW ZEALAND, 1948-51. Notornis 5(5): 157-164. July 1953. [Reprinted as Wildlife Publication no. 27 of N. Z. Dept. Internal Affairs.]
Over the 4-year period, 3,485 pen-reared pheasants were banded and released on North Island in lots averaging 6 birds. Recoveries to date are only 3.4%. By comparison, wild native ducks give 23% return. The paper also discusses causes of mortality, ages of birds, and dispersal distances.

Westerskov, Kaj. (Wildlife Division, Wellington, N. Z.) TECHNIQUES OF PHEASANT LIBERATION. New Zealand Department of Internal Affairs, Wildlife Publication no. 25. 1-28 p., illus. 1953.
Detailed discussion of how and where to release and not to release pheasants in New Zealand.

BIRDS--GROUSE, PARTRIDGE, ETC.

Belknap, John. (Gouverneur, N. Y.) THE HUNGARIAN PARTRIDGE IN NEW YORK STATE. Kingbird 2(4): 80-82, map. Dec. 1952.
After mass releases, this partridge finally became established in the northern part of N. Y. (map), where there are now 8-10 thousand. Hunting was permitted for 5 days in 1952 and about 300 were shot. Grain fields seem to be a necessary part of habitat. Clay flatlands are preferred. Light rainfall during nesting is believed to be required. Heavy winter is well endured, but sleet storms reduce the population.

BIRDS--GROUSE, PARTRIDGE, ETC.--Continued

Cade, Tom J., and John L. Buckley. (U. Alaska.) A MASS EMIGRATION OF SHARP-TAILED GROUSE FROM THE TANANA VALLEY, ALASKA, IN 1934. Condor 55(6): 313. Nov.-Dec. 1953.

Dalrymple, Byron W. WILD FLIGHT. Sports Afield 130(3): 19-23, illus. Sept. 1953.
Evidence that crazed flight of ruffed grouse is caused by alcoholism from eating fermented fruits.

Doll, A. D. (Wis. Cons. Dept.) SHARPTAILS ON THE CHEQUAMEGON. Wisconsin Conservation Bulletin 18(9): 17-19, illus. Sept. 1953.
How certain areas of this national forest in Wisconsin are being managed for sharptails. The aim is to maintain enough openings.

Erickson, Arnold B. (Minn. Div. Game.) LEUCOCYTOZOON BONASAE IN RUFFED GROUSE; ITS POSSIBLE RELATIONSHIP TO FLUCTUATIONS IN NUMBERS OF GROUSE. Journal of Wildlife Management 17(4): 536-538. Oct. 1953.
Data for 11 years, a whole grouse cycle, suggest that this parasite probably has no influence on the grouse cycle. Percentage of infection is highest in young birds, however, and it may yet be found that this protozoon plus other parasites is important in juvenile mortality.

Höglund, Nils. CAPERCAILLIE REPRODUCTION AND CLIMATE. SOME OBSERVATIONS ON THE PERIODICITY AND LOCAL VARIATIONS OF FREQUENCY OF THE CAPERCAILLIE IN SWEDEN. Papers on Game Research 8: 78-80, graph. 1952.
Egg-laying, incubation, and hatching of capercaillie, as well as influence of weather are discussed. Information is also given on seeking of food by young, and on protection of young by female. Writer discusses influence of climate and weather upon these phenomena and gives a diagram showing the relation between the frequency of capercaillie and temperature conditions.--Teppo Lampio.

Holt, Edv. PARASITES OF THE NORWEGIAN WILLOW PTARMIGAN, LAGOPUS LAGOPUS L. (Lirypas parasitter). Papers on Game Research 8: 142-149, illus. 1952.
Norwegian, English summary. Survey of endo- and ectoparasites and their effects. Most species, except the tapeworm Weinlandia microps, seem relatively harmless. Even heavy coccidial infections may cause little mortality. At Kvifjord in 1949, parasites and birds of prey were scarce and ptarmigan broods were exceptionally large and successful.--Teppo Lampio.

Hungerford, Kenneth E. (U. Idaho.) A RUFFED GROUSE DRUMMING COUNT TECHNIQUE FOR NORTHERN IDAHO CONDITIONS. University of Idaho. Forest, Wildlife and Range Experiment Station, Research Notes no. 10. 1-3 p. Mimeo. Sept. 1953.
Author's summary: "This paper describes a drumming count method for northern Idaho ruffed grouse, for use to indicate spring breeding populations. Basic observations of the drumming season, intensity and interval are recorded. The use of willow catkins as an indicator of the reliable counting period is described. A four-minute count is recommended. Typical drumming territories are described and suggestions are given for locating drumming count routes.".

Klett, Tom. (N. D. Game Dept.) GROUSE FEATHERS. North Dakota Outdoors 16(6): 8-9, illus. Dec. 1953.
Age and sex ratios of ruffed and sharptail grouse in N. D., 1950-53. Percentage of young has dropped gradually since 1950, especially in ruffed grouse, in which the change was from 1:3.27 in 1950 to 1:1.42 in 1953.

Lund, Hj. Munthe-Kaas. ENTOPARASITES IN 136 LYRURUS T. TETRIX, FROM NORWAY (Entoparasitter hos 136 orrfugl, Lyrurus t. tetrix (L.), fra Norge). Papers on Game Research 8: 150-154, illus. 1952.
Norwegian, English summary.

BIRDS--GROUSE, PARTRIDGE, ETC.--Continued

Matheson, Colin. (Nat. Mus. Wales.) THE PARTRIDGE IN WALES: A SURVEY OF GAMEBOOK RECORDS. British Birds 46(2): 57-64, graph. Feb. 1953.
Population fluctuations of Perdix perdix, 1854-1951. Average periodicity was 9.5 years. In recent decades, partridges have dwindled nearly to the vanishing point.

Siivonen, Lauri. (Game Res. Inst., Helsinki.) ON THE REFLECTION OF SHORT-TERM FLUCTUATIONS IN NUMBERS IN THE REPRODUCTION OF TETRAONIDS. Papers on Game Research 9: 1-43, maps and graphs. 1952.
Begins with examination of fluctuations during last 40 years in Finland and Northwest Europe. Regularity of the 3-4 year fluctuations is highest between lows. Fluctuations in the North are more regular, as indicated by increase in fluctuation coefficient in this direction, and by synchronism in oscillations of capercaillie, blackgame and hazel grouse. Clutch size has been largest in the optimum of the distribution of the tetraonids. Maximum nesting population has been reached in the spring following the peak fall population. Number of clutches and broods has been highest in this same spring, but clutch size, number of hatched eggs per clutch, and brood size have been reduced. Survival of broods in the summer following the fall peak has been poor, owing to disease, etc. Next fall migrations can be observed in the decreased population. It is thought that populations have a general tendency to increase, but that an unknown "decline factor" strikes every 3-4 years. Synchronism and similarity in the fluctuations of tetraonids and small rodents are discussed. The writer points out the significance of investigation of parallel phenomena in research on these problems.--Teppo Lampio.

Silver, Helenette. (N. H. Game Dept.) SEX RATIOS OF NEW HAMPSHIRE RUFFED GROUSE AS BASED ON FOUR YEARS' COLLECTION OF WINGS AND TAILS. Proc. NE. Section Wildlife Soc., 9th Annual Conf., Bretton Woods, N. H., Sept. 20-23, 1953. 1-4 p. + 4 graphs.
8,732 sets of wings and tails from N. H. were collected 1949-52. Samples from young and adults were separated and tail length was studied statistically to see if Ammann's criteria for the sexes applied in New England. It was found that slightly different separation points should be used there. Proposed system is: adult males, tail 5 6/8" or more. Adult females, tail 5 5/8" or less. Immature males, 5 4/8" or more. Immature females, tail 5 3/8" or less. Since tail lengths vary geographically, it is recommended that separation points be determined for each area under study when samples are sufficiently large. Failure to do this, however, does not introduce any great error.

Voipio, Paavo. ONE-SIDED HARVESTING OF MALES AND ITS INFLUENCE UPON THE TETRAONID POPULATIONS (Einseitige Besteuerung der Hähne und ihre Einwirkung auf den Tetraoniden-Bestand). Papers on Game Research 8: 76-78. 1952.
In German. Excess hunting of male tetraonids and its destructive influence upon reproduction of populations is discussed. Up to recent years, open seasons for males in Finland have been twice as long as for females in capercaillie and 3 times as long in blackgame. These birds are not polygamous, as believed earlier, but promiscuous. Unbalanced hunting of the sexes is obviously one important reason for the observed shortage of males in many areas and low populations of the country in general.--Teppo Lampio.

Westerskov, Kaj. (Wildlife Division, Wellington, N. Z.) THE TURNOVER PERIOD AND LIFE LENGTH OF THE WILLOW GROUSE, LAGOPUS LAGOPUS (BESTANDSSKIFTE-PERIODEN OG LEVEALDEREN HOS LIRYPEN). Naturen no. 11: 321-328. 1950.
Danish, English summary. The adult-juvenile ratio is 25:75. Calculating from this, average longevity is 16 months. The turnover period is 4-5 years. Age composition in fall and winter is about 76% juveniles, 19% 1½-year old birds, 4% 2½-year old birds, and 1% 3½-year old birds. Under these conditions there is no reason to think that there are old "barren" birds.

BIRDS--TURKEY

Grahame, Arthur. PENNSYLVANIA TALKS TURKEY. Outdoor Life 112(5): 54-55, 93, 101-105, illus. Nov. 1953.

Story of turkey restoration in state. Lumbering and overhunting eliminated turkeys in Pa. except in rugged south-central section. Legal protection helped, as did regrowth of forests. First attempts at pen-rearing produced tame birds, but today captive hens of virtually wild stock are mated with completely wild toms that fly into the enclosure. Offspring are wild in behavior and adjust well when released. 5,000 per year are produced. Most are released on state game lands, of which there are 200 units comprising nearly 1,000,000 acres. These lands generally consist of improved refuges surrounded by hunting grounds. Turkeys gradually took hold in the north-central region, although snows are deep there and acorns scarce. Artificial feeding is done in winter, but turkeys also seek out many sorts of food. Many flocks are underharvested. 1952 kill was about 12,000, an all-time record.

Smith, R. H. (N. Y. Cons. Dept.) TALKING TURKEY. New York State Conservationist 8(3): 26-27, illus. Dec.-Jan. 1953-54.

Turkeys are moving into N. Y. from Pa. and N. Y. is also releasing young game farm birds from Pa. At the request of breeders of domestic turkeys, introductions are being limited and only pullorum-free birds are used. Birds of certain ages are released at different points so best age for stocking can be determined. The article gives other information on the stocking program.

BIRDS--DOVES AND PIGEONS

Keeler, James E. (Ala. Dept. Cons.) THE MOURNING DOVE STUDY. Alabama Department of Conservation. iv + 66 p., illus. [1953.]

Report on 4-year study. Change from cotton to grain and livestock farming has improved dove habitat. It is neither necessary nor feasible to improve habitat for this bird in Alabama. Random roadside counts and call-road counts were found to be practical and to yield good data on trends in production. Data from these counts are discussed and recommendations for use of the methods are made. Populations were higher in 1952 than in 1951. Nesting peak is in May and June. About 47% of all nests found are destroyed. Blue jay is worst nest predator. Methods and results of trapping and banding are discussed. Size of population automatically governs degree of hunting pressure. History and seriousness of trichomoniasis in state are discussed. The disease is thought to be a factor limiting populations. Hunting season should fall between Nov. 1 and Jan. 30, and its length should depend on results of annual call-count census. Reduction in bag limit has little effect, for most hunters fail to kill their limit. Bag limit could be raised safely from 8 to 15 per day; this would eliminate many illegal kills.

Kossack, Charles W., and Harold C. Hanson. (Ill. Nat. Hist. Surv.) UNISEXUAL BROODS OF THE MOURNING DOVE. Journal of Wildlife Management 17(4): 541. Oct. 1953.

"Of the 21 broods recorded, 13 were composed of two males each, and 8 contained two females each." Statistically, this is very unlikely. "...if the present finding of unisexual broods is substantiated, our understanding of dove populations may be profoundly modified."

Longwell, J. R. MOURNING DOVE PROJECT: A FOUR YEAR SUMMARY 1949-52. Maryland Department of Research and Education (Solomons Island, Md.), Resource Study Report no. 2. 1-5 p., illus. May 1953.

First day of Maryland dove season varied from Sept. 1 to Oct. 5. Age composition of birds taken first day (1949-52) varied from 66% juveniles on Oct. 5 to 76% on Sept. 1. In 1952, doves taken in first half of season were 67% juveniles; in last half, only 37% were juveniles. Possible explanations of these phenomena are discussed. Age compositions for entire seasons of 1951 and 1952 were 42% and 33% adults. Judging from 164 wings of juveniles taken in 1952, 67% of hatch occurred in last 3 weeks of June and first 2 weeks of July. Little trichomoniasis was found. "The results of the study here reported

BIRDS--DOVES AND PIGEONS--Continued

indicate that the dove season in this area could be opened by September 15 with little or no detrimental effect on nestling doves, since general absence of 'pigeon milk' in adults at this time has been determined."

McGowan, Terry A. (Ky. Dept. Wildl.) THE CALL-COUNT AS A CENSUS METHOD FOR BREEDING MOURNING DOVES IN GEORGIA. Journal of Wildlife Management 17(4): 437-445, graphs. Oct. 1953.
Report on tests and analyses of this method. "Since a peak season plateau was evident, it is concluded that call counts, if taken at the proper time and in good weather, will provide a good index to relative abundance of breeding doves from year to year. Around June 1 was indicated as the best time if only a few counts are to be made."

Moore, George C. (La. Wildlife Comm.) "DEAR MR. FISH AND WILDLIFE SERVICE." Louisiana Conservationist 5(10): 16. Sept. 1953.
Open letter strongly protesting dove regulations. On the basis of the Cooperative Dove Study, 19 points are made, all indicating that doves could well stand heavier harvesting. Nine ways in which the writer believes regulations should be liberalized are listed. It is argued that Louisiana hunters have less chance at the dove crop than do hunters of other states.

Peters, Harold S. (US F&WS, Peachtree-Seventh Building, Atlanta 5, Ga.) THE MORE IMPORTANT LITERATURE ON MOURNING DOVES. ABSTRACTS OF MOURNING DOVE LITERATURE. A THIRD SET OF ABSTRACTS OF MOURNING DOVE LITERATURE. Issued by author. Mimeo. 14, 11, & 22 p. Aug. 1949, April 1951, & July 1953.
These three sets of abstracts of dove literature should be of value to all concerned with this bird. Unpublished as well as published reports are included. Coverage is more complete than in WR and abstracts are often more detailed.

BIRDS--WATERFOWL

Balham, R. W. (N. Z. Wildlife Div., Wellington, N. Z.) GREY AND MALLARD DUCKS IN THE MANAWATU DISTRICT, NEW ZEALAND. Emu 52(3): 163-191, illus. Aug. 1952.
Detailed report of 3-year study. Author's abstract: "Observations are made on life histories, weights and measurements, hunting pressure, sex ratios, banding results, seasonal dispersion, and feeding habits. The consequences of increased cultivation of land and of an altered environment are discussed."

Balham, Ronald W., and Wm. H. Elder. (U. Mo.) COLORED LEG BANDS FOR WATERFOWL. Journal of Wildlife Management 17(4): 446-449, illus. Oct. 1953.
Review of old methods and their shortcomings, and instructions for use of new Plexiglas method.

Beard, Elizabeth B. (U. Mich.) THE IMPORTANCE OF BEAVER IN WATERFOWL MANAGEMENT AT THE SENEY NATIONAL WILDLIFE REFUGE. Journal of Wildlife Management 17(4): 398-436, illus. Oct. 1953.
Detailed studies during 3 years demonstrated the great value of beaver marshes to waterfowl. Factors governing suitability for waterfowl are elucidated. Habitat types and their use by waterfowl are described. Number of waterfowl produced per acre ranged from 1.7 to 4.6. Other birds and animals also profited from beaver marshes. Recommendations call for: 1. Maximum beaver population possible without overpopulation and abandonment of ponds and dams. 2. Artificial repair of abandoned beaver dams. 3. Construction of low, cheap artificial beaver dams at favorable sites. 4. Diversion of water to dry marshes, with beaver relied upon to carry on from there. Beavers create almost ideal waterfowl habitat. Man should seek to emulate them instead of concentrating so much on large ponds and lakes.

BIRDS--WATERFOWL--Continued

Bednarik, Karl, and John Anderson. (Oak Harbor, Ohio.) HOW GOOD IS OHIO'S DUCK FACTORY? Ohio Conservation Bulletin 17(10): 4-5, 31-32, illus. Oct. 1953.
Relatively technical discussion of present waterfowl production in Ohio, and of biologically sound timing of hunting season.

Boyd, Hugh. ON ENCOUNTERS BETWEEN WILD WHITE-FRONTED GEESE IN WINTER FLOCKS. Behavior 5(2): 86-129. 1953. [From informative review by M. M. Nice, Bird-Banding 24(4).]
"Detailed observations of mechanisms of adjustment of conflicts in large flocks of Anser a. albifrons on the estuary of the River Severn in Gloucestershire, England during three winters."

Brakhage, George K. (Duck Creek Wildl. Area, Puxico, Mo.) MIGRATION AND MORTALITY OF DUCKS HAND-REARED AND WILD-TRAPPED AT DELTA, MANITOBA. Journal of Wildlife Management 17(4): 465-477, maps. Oct. 1953.
Hand-reared ducks migrate normally and return to the marsh of release. Their rate of mortality in the first year, however, is 18-33% higher than that of wild birds. Hand-reared birds are from 40-152% more vulnerable to hunting on marsh of release than are wild ducks. Eventual result of collecting eggs for hand-rearing ducklings may be to reduce breeding population of the marsh. "Ducks hand-reared from wild eggs are more suitable stock for experimental liberation than game-farm birds because of their ability to retain a normal migratory behavior pattern. However, when considering the high mortality of hand-reared birds, the deteriorating effects on the populations in marshes where eggs are gathered, and the expenditures necessary to promote an artificial liberation program, the release of ducks hand-reared from wild eggs can not be recommended as a practical management technique."

Cooch, Graham. (Cornell U.) TECHNIQUES FOR MASS CAPTURE OF FLIGHTLESS BLUE AND LESSER SNOW GEESE. Journal of Wildlife Management 17(4): 460-465, illus. Oct. 1953.
By special Eskimo herding techniques, thousands of molting geese can be guided into small pens for banding and study.

Coulter, Malcolm W. (U. Maine.) MALLARD NESTING IN MAINE. Auk 70(4): 490. Oct. 1953.
Three records of nests or broods.

Gabrielson, Ira N. (Wildl. Mgt. Inst.) ALASKAN WATERFOWL AND THEIR MANAGEMENT. In Collins, H. B., ed., Science in Alaska: Selected Papers of the Alaskan Science Conference of the National Academy of Sciences, National Research Council, Washington, November 9-11, 1950. Arctic Institute of North America. 292-305 p. June 1952. [From Polar Record 6(46).]
"Population, distribution and breeding habits; recommended protection measures."

Grenquist, P. RECENT CHANGES IN THE POPULATIONS OF THE EIDER, SOMATERIA M. MOLLISIMA, AND THE VELVET SCOTER, MELANITTA F. FUSCA, IN THE FINNISH ARCHIPELAGO (Förändringar i ejderns och svärtans förekomst i den finska skärgården). Papers on Game Research 8: 81-100, maps and graphs. 1952.
Swedish, English summary. Both species have increased in S. and SW. Finland since 1947. The eider reached a maximum in May, 1949. Differences in the different parts of the area are reported and their causes discussed. Information is also given on population densities in recent decades and on some environmental factors such as changes in salinity and predation.--Teppo Lampio.

Johnsgard, Paul A. (N. D. Agr. Coll.) WATERFOWL OF NORTH DAKOTA. North Dakota Institute for Regional Studies, N. D. Agricultural College. 1-17 p., illus. 1953.
Popular field key based on Peterson-type characters and drawings. Species

BIRDS--WATERFOWL--Continued

accounts stress field marks and give a few facts about status and migration in state, or notes on habits. The booklet seems well geared to hunters' interests and needs.

King, Calvin L. (Wyo. Game Comm.) OIL SUMPS--DUCK NEMESIS. Wyoming Wild Life 17(11): 32-33, illus. Nov. 1953.
Oil sumps are bodies of oily water resulting from oil field operations. Emulsified oil gradually rises to the top. In the Big Horn Basin drainage, 914 dead birds (90% of them dabbling ducks) were found dead in sumps in 1951 and 1952. Oil is periodically burned from most sumps. Chemical treatment is also successful. Rattling pieces of tin strung over sumps have kept birds away.

Koskimies, Jukka, and Eero Routamo. ON BREEDING BIOLOGY OF THE VELVET SCOTER, MELANITTA F. FUSCA. I. GENERAL NESTING ECOLOGY (Zur Fortpflanzungsbiologie der Samtente, Melanitta f. fusca (L.). I. Allgemeine Nistökologie). Papers on Game Research 10: 1-105, illus. 1953.
German, 4 page English summary. During the last few decades the velvet scoter has extended its range to outer parts of the archipelago of the Gulf of Finland, where the present study was carried out in 1948-52. This is an excellent paper giving valuable information on many aspects of breeding ecology. There are detailed data on spring migration, daily activity, feeding and mobility of the adults, territory and territorial fights, nesting sites, "ortstreue," egg laying, downing of the nest, clutch size, intra- and interspecific "dump" nests, incubation, hatching, mortality of young in eggs, habits of males during egg laying and incubation, etc. The paper, including its detailed bibliography, should be valuable to any one interested in breeding biology of waterfowl.--Teppo Lampio.

Marshall, William H., and Stanley Harris. (U. Minn.) SPECIES COMPOSITION, SEX AND AGE RATIOS, AND WEIGHTS OF SOME DUCKS BAGGED BY MINNESOTA HUNTERS. Flicker 25(2): 54-61. June 1953.
Title is descriptive. Data are for 1946-50 and 1952. Samples were from Becker Co., Grant Co., and Detroit Lakes area.

McGinnes, Burd S., and Robert A. Beck. (Del. Game Comm.) RECUPERATIVE RATE OF WING-SHOT MALLARD. Journal of Wildlife Management 17(4): 541-542. Oct. 1953.
A female black duck had wing bone well knitted soon after end of hunting season. A female mallard with severe fresh fracture made much progress to recovery in 13 days in the wild.

Miller, Harvey. NEBRASKA WATERFOWLING: PAST, PRESENT, FUTURE? Outdoor Nebraska 31(4): 5-8, illus. Fall 1953.

Mumford, Russell E. (Cortland, Ind.) SOME NOTES ON THE BLUE-WINGED TEAL IN INDIANA. Indiana Audubon Quarterly 30(4): 63-66, map. Oct. 1952.
Some teal summer in state without nesting, making breeding census difficult. Migration follows rivers, which are used for resting and feeding. Peak numbers appear in April and October. Drakes outnumber hens in spring flights. About 80% are paired on arrival. Past and present nesting areas in state are listed and mapped. Nesting is now only in northern counties. Breeding marshes continue to be lost through drainage.

Patterson, Robert L., and Robert M. Ballou. (Wyo. Game Comm.) THE STATUS OF THE CANADA GOOSE IN WYOMING. Wyoming Wildlife 17(8): 4-14, 36, illus. Aug. 1953.
The authors found that many territorial pairs were not nesting, perhaps because of youth and, in part, nest failure. Of 1,900 geese, only about 670 were actually breeding. If this situation is general, previous state and federal estimates of breeding goose (and perhaps other waterfowl) populations have been far too high. Size and distribution of goose colonies in Wyoming

BIRDS--WATERFOWL--Continued

are reported, and the following factors governing them are discussed: "1. Distance from areas of dense breeding populations in adjacent states. 2. Pattern of agriculture and water development on the drainage. 3. Intensity of human disturbance. 4. Elevation as related to snow depth and melting dates. 5. Availability of suitable nesting sites." Various goose restoration areas are being set up and stocked with young geese. Young are trapped, or hatched from eggs collected in the field; the latter is considered more economical and practical. Stocking records are given. Most nests are on haystacks or islands; since haystacks may be used up by spring and islands may be flooded, artificial nesting platforms are being tried.

Polunin, Nicholas, and Carl R. Eklund. (Harvard U.) NOTES ON FOOD HABITS OF WATERFOWL IN THE INTERIOR OF UNGAVA PENINSULA. Canadian Field-Naturalist 67(3): 134-137. July-Sept. 1953.
Stomach contents of 4 Canada geese, 1 old-squaw, and 1 black duck taken in an area where usual waterfowl food plants were virtually lacking.

Sieh, James G. (Iowa Cons. Comm.) THE WATERFOWL STORY IN IOWA. Iowa Bird Life 23(3): 42-50, illus. Sept. 1953.
See WR 73:70.

Sirén, Mika. STUDIES ON THE BREEDING BIOLOGY OF THE GOLDENEYE (Undersökningar över knipans, Bucephala clangula, fortplantningsbiologi). Papers on Game Research 8: 101-111, maps and graphs. 1952.
Swedish, English summary. In a study using more than 100 nesting boxes, the goldeneye population was increased in 5 years from 0 to 11. Incubation rhythm studied using a recording apparatus is reported in 4 diagrams. Data are given on temperature and humidity in nest, departure of young from nest, and on events of first weeks in lives of broods. Four figures show routes of broods in first days of life.--Teppo Lampio.

Spencer, Howard E., Jr. THE CINNAMON TEAL (ANAS CYANOPTERA VIEILLOT) ITS LIFE HISTORY, ECOLOGY, AND MANAGEMENT. M. S. thesis, Utah State Agricultural College. 184 p. 1953.

Spinner, George P. (US F&WS, Boston, Mass.) EFFICIENCY OF THE PHOTOGRAPHIC GUIDE METHOD IN INCREASING ACCURACY IN ESTIMATING NUMBERS OF WATERFOWL. Proc. NE. Section Wildlife Soc., 9th Annual Conf., Bretton Woods, N. H., Sept. 20-23, 1953. 1-8 p. + 2 tables.
Tests demonstrated that both experienced and inexperienced men were better able to estimate numbers of small objects (rice grains) in photographs when aided by a photograph showing a known number of the objects. In practice, photos showing different numbers of birds and different shapes of rafts would be used.

Turner, Lewis B. (Box 297, Manteo, N. C.) A RAPID METHOD OF SEXING CANADA GEESE. Journal of Wildlife Management 17(4): 542-543, illus. Oct. 1953.
Dorsal profile of bill of female is more concave. That is, if straightedge is laid along bill and forehead, middle of female bill usually clears edge by 1/8 to 5/16 in., while in male clearance is about 1/16 to 1/8 in. This technique is not reliable for all individuals. Of 415 geese at Pea Island, N. C., males averaged 8.6 lbs., females 6.7, a difference of 1.9 lbs. Of course, weights broadly overlapped. Adult males have rounded callosity at wrist joint. Adult females have more smoothly scaled legs than do adult males.

Williams, C. S., compiler. (US F&WS.) 1953 STATUS REPORT OF WATERFOWL. U. S. Fish and Wildlife Service, Special Scientific Report: Wildlife no. 22. 1-64 p. Aug. 1953.
Presents information on which 1953-54 hunting regulations were based. Data on kill, winter populations, and breeding ground surveys are given for each flyway and for states and provinces. Summaries are provided for each

BIRDS--WATERFOWL--Continued

section. One important point is that the new Hunter Mail Survey has shown that previous figures on kill (obtained by bag checks and post-season contacts) were approximately 3 times too high. [This change in kill figures will have little effect on regulations, however, for regulations are necessarily based on trends.]

Yeagley, Henry L. (Pa. St. Coll.) SOME SURPRISES IN RESEARCH. Audubon Magazine 55(4): 158-161, illus. July-Aug. 1953.
Describes new and apparently very successful method of rearing wood ducks.

Zimmerman, F. R. WATERFOWL HABITAT SURVEYS AND FOOD HABIT STUDIES, 1940-1943. Wisconsin Conservation Department, Final Report Pittman-Robertson Project 6-R. v + 176 p. 1953.
102 of the most important Wisconsin waterfowl areas are described, with information on size, nature of water, soils, plants, evaluation of food and cover, waterfowl use, hunting, fishing, and for many areas, recommendations. Although the data were collected a decade ago they still have comparative and historical value. The food habits section reports both by per cent of volume and occurrence the foods found in 621 gizzards of 21 species of waterfowl. 226 of the gizzards were from mallards. Food habits work was done by George B. Rossbach.

BIRDS--CRANES, RAILS, SHOREBIRDS

Anonymous. HURRICANE SLAUGHTERS RAILS ON EASTERN SHORE. Virginia Wildlife 14(10): 26, illus. Oct. 1953.
Thousands of clapper rails were drowned or injured in Va. by hurricane of Aug. 14. Some were not old enough to fly.

Meanley, Brooke. (US F&WS, Stuttgart, Ark.) NESTING OF THE KING RAIL IN THE ARKANSAS RICE FIELDS. Auk 70(3): 261-269, illus. July 1953.
Based on study of 38 nests during 3 seasons, 1950-52. Five nests were found in a 70-acre rice field, and 5 in a ditch 300 yards long. Both sexes may build nest, and both incubate. Average clutch was 10.7. Incubation period was about 22 days. At least one egg hatched in 12 of 16 nests. Entire clutch hatched in 31.2% of nests. Average number of eggs hatched per nest was 9.9. Of 147 eggs in 16 nests, 80.9% hatched. Survival of young to 2 weeks was about 50%. Data are also given on locations of nests, building up of nests when water rose, size and weight of eggs, weights of adults and young, behavior of parents, and mortality factors.

Schwartz, Charles W., and Elizabeth Reeder Schwartz. (Mo. Cons. Comm.) THE HAWAIIAN STILT. Auk 68(4): 505-506, illus. Oct. 1951.
This stilt, Himantopus himantopus knudseni, is a vanishing form. Thanks to a closed season, about 1000 individuals exist, but their habitat is rapidly disappearing. Notes are given on habitat, measurements, parasites, and foods. Six good photographs.

OTHER BIRDS

Barth, Edvard K. BREEDING BIOLOGY OF THE ROUGH-LEGGED BUZZARD, AND VARIATIONS IN THE POPULATION IN 1938-1952 (Litt forplantningsbiologi hos fjellvåken, Buteo lagopus, og svingninger i bestanden 1938-1952). Papers on Game Research 8: 127-138, illus. 1952.
Norwegian, English summary. Fluctuations in abundance and reproduction depend greatly on number of small rodents. The birds feed mostly on mice and lemmings when these are plentiful. When these are scarce, game animals (including willow ptarmigan, blackgame and capercaillie) are taken. In 1938-52, peak populations of small rodents and rough-legged buzzard coincided. Despite abundance of small rodents in 1945-46, however, population and reproduction of the buzzard remained rather low. The paper also gives information on spring migration, as well as on egg laying, hatching, growth of young and other nesting phenomena.--Teppo Lampio.

OTHER BIRDS--Continued

Beecher, William J. (Chicago Nat. Hist. Mus., Chi. 5.) A PHYLOGENY OF THE OSCINES. Auk 70(3): 270-333, illus. July 1953.
A long and detailed paper that discusses the relationships and evolution of the higher groups of passerine birds. Conclusions are based largely on study of jaw musculature and other internal features. A family tree is presented. The arrangement is novel in a number of respects, but in other ways parallels recent thinking of other ornithologists.

Beecher, William J. (Chicago Nat. Hist. Mus., Chi. 5.) FEEDING ADAPTATIONS AND SYSTEMATICS IN THE AVIAN ORDER PICIFORMES. Journal of Washington Academy of Sciences 43(9): 293-299, illus. Sept. 1953.
Anatomy and relationships of major groups.

Dickinson, J. C. GEOGRAPHIC VARIATION IN THE RED-EYED TOWHEE OF THE EASTERN UNITED STATES. Harvard University, Bulletin of the Museum of Comparative Zoology 107(5): 273-352, illus. 1952. $1.30 (paper). [From review by H. C. Seibert, Quarterly Review of Biology 28(3).]
Comprehensive systematic study.

Glover, Fred A. (Patuxent Refuge, Laurel, Md.) SUMMER FOODS OF THE BURROWING OWL. Condor 55(5): 275. Sept.-Oct. 1953.
Report on contents of 405 pellets from central Arizona. Author concludes that this owl should be encouraged as an asset to agriculture.

Hagen, Yngvar. ROVFUGLENE OG VILTPLEIEN (PREDATORY BIRDS AND GAME PRESERVATION). Gyldendal Norsk Forlag, Oslo. 603 p., 114 figs. 1952. 50 crowns. [From long review by H. M. S. Blair, British Birds 46(3).]
Important monograph, in Norwegian, on biology of the 25 hawks and owls of Norway. Distribution, life history, and economics are treated at length. Foods are discussed on the basis of 11,221 prey records. It is shown that populations of some species fluctuate with the supply of rodents--with little or no breeding in poor years. When food is scarce, breeding may not be attempted. If food becomes scarce during breeding, many young starve. The heaviest toll of birds is taken at such times. The author suggests that competition for birds may become so severe that reproduction even of habitual bird-eaters is lowered. One interesting point is that lemmings are not nearly so favored as prey as are voles; lemmings are not even well digested, and many of those caught are not eaten. General chapters of the book treat such subjects as past and present policies of game conservation in Norway, and fluctuations in game stocks as related to fluctuations of rodents and predators.

Hartley, P. H. T. (Edward Grey Inst., U. Oxford, Eng.) AN ECOLOGICAL STUDY OF THE FEEDING HABITS OF THE ENGLISH TITMICE. Journal of Animal Ecology 22(2): 261-288, graphs. Nov. 1953.
Feeding habits of 5 species of Parus living in same areas were studied for 3 years. Each species characteristically foraged at certain heights and in favored kinds of trees, so specialization reduced direct competition. These ecological distinctions varied from season to season, and from place to place, depending on scarcity or plenty of food. The distinctions sometimes broke down when food was superabundant.

Hutchison, Frank T. THE EFFECTS OF WOODPECKERS ON THE ENGELMANN SPRUCE BEETLE DENDROCTONUS ENGELMANNI HOPKINS. M. S. thesis, Colorado A. & M. College. 73 p. 1951.
Thirty acres of spruce, heavily infested with beetles, were studied one week a month from November to June. Nineteen pairs of woodpeckers, mostly alpine three-toed with a few downy and hairy, fed on the study area. Seventy-seven woodpeckers were killed and examined. Ninety-nine percent of their food was Dendroctonus and the woodpeckers were credited with destroying 55 percent of the spruce beetles on the study area. Male woodpeckers ate almost twice as many beetles as did females. "From data

OTHER BIRDS--Continued

presented, it could be concluded that an increase in the woodpecker population would aid materially in cutting the cost of artificial control....It would also tend to prohibit future epidemics once the beetles are under control."--Victor B. Scheffer.

Kessel, Brina. (U. Alaska.) SECOND BROODS IN THE EUROPEAN STARLING IN NORTH AMERICA. Auk 70(4): 479-483. Oct. 1953.
Many starlings rear 2 broods a season, but not 3.

Lockley, R. M. PUFFINS. J. M. Dent and Sons, London. xi + 186 p., illus. 1953. 18s. [From review in Nature 172(4374).]
Monograph on Fratercula arctica. Author "deals with the puffin from the time it returns to its breeding haunts in early spring until the last deserted young one goes off to sea. In addition, the author has chapters on the 'Mind of a Bird,' the 'Winter Ocean' and 'Man and Puffin,' with appendixes on 'Numbers,' 'Distribution,' 'Recoveries of Ringed Puffins,' etc." Total population of species is estimated to be 15 to 16 millions. The population has declined in the last century, but the puffin is still one of, if not the most abundant of Atlantic seabirds.

Moore, Joseph C., Louis A. Stimson, and William B. Robertson. (Everglades Nat. Park, Homestead, Fla.) OBSERVATIONS OF THE SHORT-TAILED HAWK IN FLORIDA. Auk 70(4): 470-478. Oct. 1953.
Seasonal occurrence (rare in summer), color phases, field marks, notes on behavior, habitat, abundance (now more common).

Rand, R. W. GUANO ENTERPRISE IN SOUTH WEST AFRICA. Ostrich 23(3): 169-185. 1952. [From review by H. H. Poor, Bird-Banding 24(4).]
Broad discussion of biological and economic aspects of this resource, which depends chiefly on cormorants of several kinds.

Schneider, W. BEITRAG ZUR LEBENSGESCHICHTE DES STARS, STURNUS V. VULGARIS L. Beitr. Vogelkunde 3: 27-52. 1952. [From abstract by E. M., Auk 70(3).]
"Based on 25 years of observation of a starling colony, in which 950 breeding adults and 1350 of their young were banded. Data on migration, returns, and broods. About 50 per cent of the females have a second brood, often in the same nest box. No second broods in certain years. Average May clutches 5.7 eggs, June 4.1 eggs. Successful broods in May had 4.6 fledglings, in June 3.3 fledglings."

Sprunt, Alexander, Jr. NEWCOMER FROM THE OLD WORLD. Audubon Magazine 55(4): 178-181, illus. July-Aug. 1953.
Summary of knowledge of cattle egret in U. S. Includes breeding records and excellent photographs.

Storer, Robert W. (Mus. Zool., U. Mich.) A COMPARISON OF VARIATION, BEHAVIOR AND EVOLUTION IN THE SEA BIRD GENERA URIA AND CEPPHUS. University of California Publications in Zoology 52(2): 121-222, illus. Oct. 1952. $1.25.

Suomus, Heikki. STUDIES ON THE FEEDING HABITS OF THE COMMON BUZZARD (Näringsundersökningar över ormvråken). Papers on Game Research 8: 121-127. 1952.
Swedish, English summary. Foods and feeding behavior of nesting Buteo b. vulpinus in Finland as related to prey abundance. Remains around nest may give wrong idea of proportions of foods, as small animals are eaten whole, while parts of game animals remain. This error is greater after young are fairly well grown.--Teppo Lampio.

Walkinshaw, Lawrence H. (1703 Wolverine Tower, Battle Creek, Mich.) LIFE-HISTORY OF THE PROTHONOTARY WARBLER. Wilson Bulletin 65(3): 152-168, illus. Sept. 1953.

OTHER BIRDS--Continued

Wallraff, H. G. BEOBACHTUNGEN ZUR BRUTBIOLOGIE DES STARES (STURNUS V. VULGARIS L.) IN NÜRNBERG. Journ. f. Ornith. 94: 36-67. 1953. [From abstract by E. M., Auk 70(3).]

"A very detailed report of observations made on 5 starling nests during four years. Roosting, pre-pairing activities, territory, pair-formation, sex-ratio, polygamy, nest-building, egg-laying, eggs, incubation, hatching, fledging, and second broods are described and quantitatively documented, as is the participation of the male in incubation and feeding..."

Wendland, V. POPULATIONSSTUDIEN AN RAUBVÖGELN. I. ZUR VERMEHRUNG DES MÄUSEBUSSARDS (Buteo b. buteo (L.)). Journ. f. Ornith. 93: 144-153. 1952. [From abstract by E. M., Auk 70(3).]

"Of 170 broods of buzzards studied over a number of years, 31 per cent were destroyed, mostly through human interference. On the average, a pair raises 1.4 young. In the year of a vole plague the average was 2.6 young, in two other mouse years 1.77 and 1.52. In extensive pine-forests other animals, such as birds, reptiles, and frogs, are important food."

Wendland, V. POPULATIONSSTUDIEN AN RAUBVÖGELN: BRUTERFOLG 1940-1951, UNTERSUCHT BIE 7 ARTEN. Journ. f. Ornith. 94: 103-113. 1953. [From abstract by E. M., Auk 70(3).]

"331 pairs of seven species of birds of prey were studied in the years 1940 to 1951. The percentage of destroyed broods ranged from 28 (Goshawk) to 76 (Peregrine Falcon). Chief causes of destruction were man (Peregrine, Goshawk, Buzzard), crows (Kite, Hobby) and other hawks (Kestrel). The number of young raised per pair ranged from .47 (Peregrine) to 1.9 (Kestrel). The mouse-eating species (Buzzard, Kestrel) may have high mortality in the nest when mice are scarce. Population numbers remained static for most species. Goshawks increased after shooting terminated in 1945, Peregrines decreased when pigeons became scarce in the same year."

White, H. C. (Atlantic Biol. Sta.) THE EASTERN BELTED KINGFISHER IN THE MARITIME PROVINCES. Fisheries Research Board of Canada (Ottawa), Bulletin no. 97. 1-44 p., illus. 1953. 45¢.

Gives a good review of life history, with much original information, and reports in detail food habits on many waters, including trout and salmon streams. Complexity of predation relationships is stressed, but the author's concept of the kingfisher's economic status is pretty well summarized in the following quotation: "In many, and perhaps most cases, kingfishers are harmless to the production of desired species and in some cases may be beneficial. In particular cases where salmon and trout are not abundant but are still predominant in the population, kingfishers may be harmful to those species. Even in streams in which the salmonids predominate, kingfishers do not appear in general to be nearly as harmful as mergansers, and there are believed to be few cases in which organized destruction of kingfishers would be economically justified." Mergansers, unlike kingfishers, reduce populations of young salmon and other fishes far below carrying capacity of the streams in most or all good salmon streams of the Maritimes. This has been demonstrated by control experiments.

Wiggins, Ira L. (Arctic Res. Lab., Pt. Barrow, Alaska.) FORAGING ACTIVITIES OF THE SNOWY OWL (NYCTEA SCANDIACA) DURING A PERIOD OF LOW LEMMING POPULATION. Auk 70(3): 366-367. July 1953.

One fed on a wounded eider. Another regularly patrolled for phalaropes injured by flying into a line of wire.

REPTILES AND AMPHIBIANS

Barnum, B. Bruce. (USDA, Chico, Calif.) LIKE TO BE A FROG FARMER? Reclamation Era 39(6): 118-119, illus. June 1953.
How Frank Ondricek of Orland, Calif., is managing and mechanizing his frog farm. Adults feed on food attached to moving chains as well as on insects attracted by lights. Operations are in their third year and marketing has not begun, so economics of the venture are not established.

Blair, W. F. (U. Texas.) GROWTH, DISPERSAL AND AGE AT SEXUAL MATURITY OF THE MEXICAN TOAD (BUFO VALLICEPS WEIGMANN). Copeia 1953(4): 208-212. Nov. 1953.

Brandt, B. B. (N. C. St. Coll.) SALIENTIA OF BLECKLEY COUNTY, GEORGIA, AND VICINITY. Herpetologica 9(3): 141-145. Oct. 1953.

Carpenter, Charles C. (U. Okla.) AN ECOLOGICAL SURVEY OF THE HERPETOFAUNA OF THE GRAND TETON--JACKSON HOLE AREA OF WYOMING. Copeia 1953(3): 170-174. Aug. 1953.

Dickson, John D., III. THE PRIVATE LIFE OF THE BOX TURTLE. Everglades Natural History 1(2): 58-62, illus. June 1953.
Brief life history of Florida box turtle. Based on personal study of many wild and captive individuals. Topics include: enemies, size, food, aquatic propensities, eggs and laying, predators of eggs, size of eggs and hatchlings, remarks on growth.

Eaton, Theodore H., Jr. (E. Carolina Coll.) SALAMANDERS OF PITT COUNTY, NORTH CAROLINA. Journal of the Elisha Mitchell Scientific Society 69(1): 49-53. June 1953.
Occurrence and habitats of 13 species; critical comments on taxonomy of Desmognathus fuscus.

Edgren, Richard A., Margery K. Edgren, and L. H. Tiffany. (G. D. Searle and Co., Chicago.) SOME NORTH AMERICAN TURTLES AND THEIR EPIZOOPHYTIC ALGAE. Ecology 34(4): 733-740. Oct. 1953.

Farner, Donald S., and James Kezer. (St. Coll. Wash.) NOTES ON THE AMPHIBIANS AND REPTILES OF CRATER LAKE NATIONAL PARK. American Midland Naturalist 50(2): 448-462. Oct. 1953.
Information on ecology, natural history, and local distribution of all species known in the park.

Gordon, Robert E. (Tulane U.) A POPULATION OF HOLBROOK'S SALAMANDER, EURYCEA LONGICAUDA GUTTOLINEATA (HOLBROOK). Tulane Studies in Zoology 1(4): 55-60, graphs. Aug. 1953.
Study of large samples from Jackson County, Florida. Topics include: internal criteria of sexual maturity; size at maturity; size groups; season of egg laying; vomerine counts; body measurements; sex ratios.

Logier, E. B. S. THE FROGS, TOADS AND SALAMANDERS OF EASTERN CANADA. Clarke, Irwin & Co., Toronto. xii + 127 p., illus. 1952. $3.75. [From review by Sherman Bleakney, Canadian Field-Naturalist 67(3).]
Excellent handbook, with illustrated keys, other illustrations, life histories, range statements, and 57 pages on biology of amphibians.

Martof, Bernard. (U. Ga.) HOME RANGE AND MOVEMENTS OF THE GREEN FROG, RANA CLAMITANS. Ecology 34(3): 529-543, illus. July 1953.
Home ranges varied in size from 20 to 200 square meters. Adults returned to their ranges after extensive breeding movements. Differences in habitats and habits prevent much competition and predation between young and adults. Data are also given on dates of emergence from hibernation, and effects of weather on behavior.

REPTILES AND AMPHIBIANS--Continued

Miles, Lillian E. THE DESERT TORTOISE. Audubon Magazine 55(4): 172-185, illus. July-Aug. 1953.
Notes on natural history of captives.

Minton, Sherman A., Jr. (Ind. U. Med. Center, Indianapolis.) VARIATION IN VENOM SAMPLES FROM COPPERHEADS (AGKISTRODON CONTORTRIX MOKESON) AND TIMBER RATTLESNAKE (CROTALUS HORRIDUS HORRIDUS). Copeia 1953(4): 212-215. Nov. 1953.

Schmidt, Karl P. A CHECK LIST OF NORTH AMERICAN AMPHIBIANS AND REPTILES. 6th ed. American Society of Ichthyologists and Herpetologists. viii + 280 p. 1953. $3.50. Order from N. B. Green, Marshall College, Huntington, W. Va.
Standard list for America north of Mexico. It is more accurate and useful than the later editions of Stejneger and Barbour, which it replaces. It not only lists technical names and ranges, but includes synonyms and gives common names for species and subspecies. All names are indexed. The volume is highly recommended and the author deserves much credit for its completion. As with any extensive work, however, it is easy to pick flaws, or to wish that different approaches had been taken on certain matters. At least one technical name, Masticophis bilineatus lineolatus Hensley, was overlooked. One misses any citation to the revival of Coluber constrictor foxi, now the name of the common blue racer of the Midwest. Despite the author's announced intent to place closely related vicarious forms in the same species, Pituophis catenifer and P. melanoleucus are kept separate although evidence that they are conspecific has been published and is cited here. Common names for genera are not provided, although often needed. Some common names chosen will be far from acceptable to many workers. The objectionable names "chicken snake" and "milk snake" are perpetuated. Numerous subspecific common names lack any similarity to the specific name, as when Elaphe guttata is termed "corn snake" and E. g. emoryi is termed "Great Plains rat snake." We strongly hope that common names will not be frozen by this check list.

Shannon, Frederick A. (Wickenburg, Ariz.) CASE REPORTS OF TWO GILA MONSTER BITES. Herpetologica 9(3): 125-127. Oct. 1953.
Both painful, neither fatal.

Shannon, Frederick A. (Box 276, Wickenburg, Ariz.) COMMENTS ON THE TREATMENT OF REPTILE POISONING IN THE SOUTHWEST. Southwestern Medicine 34(10): 367-373, illus. Oct. 1953.
A technical and critical discussion of the problem by a man who is an M.D. as well as a herpetologist. Topics considered include: classification and pathological action of venom types, anatomical considerations of venom spread, Pope's new concept of treatment, use of tourniquet, supportive measures, antivenin, and the L-C treatment. Dangers and undesirability of deep incisions at fang punctures are stressed. Suggestions are made to doctors for experimental treatment of coralsnake bites. "Antivenin, as presently developed for pit viper-bites is largely if not entirely useless and may be highly dangerous. ...At the present time, no physician should feel morally or legally obligated to use crotalid antivenin..." The L-C or cryotherapy treatment of Stahnke, (see WR 73:75), recently much publicized, is severely criticized on technical grounds. "It should be concluded that the 'L-C treatment' of snake-bite should be rejected in toto." Treatment recommended is the familiar one of wise use of tourniquet, shallow incision followed by suction, and supportive measures.

Warren, James W. (U. Calif. at Los Angeles.) NOTES ON THE BEHAVIOR OF CHIONACTIS OCCIPITALIS. Herpetologica 9(3): 121-124. Oct. 1953.

Wentz, Charles M. (Visalia, Calif.) EXPERIMENTING WITH A CORAL KING SNAKE. Yosemite Nature Notes 32(8): 80, illus. Aug. 1953.
Snake quickly returned to nest of quail eggs when transported from 50 yards to ¼ mile. Return trips were observed.

REPTILES AND AMPHIBIANS--Continued

Wood, John Thornton. (Box 534, Williamsburg, Va.) PROTECTIVE BEHAVIOR AND PHOTIC ORIENTATION IN HATCHLING SNAPPING TURTLES, CHELYDRA SERPENTINA SERPENTINA (LINNE'), IN AN AQUATIC ENVIRONMENT. Journal of the Elisha Mitchell Scientific Society 69(1): 54-59, diagrams. June 1953.

In aquarium tests, hatchlings sought darkened areas from which they could look into well lighted areas. This tendency was even stronger after feeding, when many buried themselves in sand. Such burial was often complete in the lighted zone, but incomplete, with heads protruding, in the twilight zone. Digging into sand was done chiefly by the front feet.

Zim, Herbert S., and Hobart M. Smith. REPTILES AND AMPHIBIANS / A GUIDE TO FAMILIAR AMERICAN SPECIES. Simon and Schuster, N. Y. Golden Nature Guide Series. 1-157 p., illus. 1953. $1.00, paper; $1.50, cloth.

Full color pictures of 212 species make this little book well worth having and a real bargain. All illustrations are by James Gordon Irving and many are excellent. A few are too tiny to show anything. Small maps show ranges of species or groups. The text, occupying less than half the space, gives simple information on habits and occasional notes on recognition characters. Most common species are treated, and apparently all genera are represented to some degree, although the representation sometimes is too slight to be of value. It is often difficult to tell whether a genus or subspecies is being discussed. The book is not intended as a complete identification guide and should not be relied on for such use. It should be useful, however, in allowing children and others to identify some of their finds and to learn a little about them. Minor errors and inconsistencies are scattered through the book, but the main criticism is that common names only are used and that many of these names are new or unfamiliar. Even herpetologists may wonder what some of them refer to. Certain names are objectionable, particularly "red king snake" for the "milk snake" or "house snake," which, as the picture shows, is not red.

FISHES

Davis, H. S. CULTURE AND DISEASES OF GAME FISHES. University of California Press. x + 332 p., illus. 1953. $5.00.

This easily understood reference incorporates many recent findings. Part I treats in a comprehensive yet nontechnical manner the common methods of propagation, with emphasis on operation of trout hatcheries. Methods of taking and fertilizing eggs, care and handling of eggs and young fish, selective breeding, feeding, and nutrition are discussed for trout, salmon, grayling, pike, and muskellunge. Production of centrarchids and other pondfish is covered in a section dealing with principles and problems of pondfish culture. A section on farm ponds contains the surprising statement that emphasis on fish production often results in the depressing condition of turbid, discolored water. A discussion of use of bluegills in farm ponds lists a long spawning season as a special qualification, but excessive reproductive capacity as the worst fault. Part II contains practical, well written sections on methods of parasite and disease control in hatcheries; and descriptions of disease organisms, with data on life histories, reproduction, symptoms, pathology, and specific control measures. Useful appendixes, good illustrations, and a 17-page bibliography aid in making this book indispensable to fish culturists and helpful to biologists.--John T. Linehan.

Knapp, Frank T. FISHES FOUND IN THE FRESH WATERS OF TEXAS. Ragland Studio and Engraving Co., 1517 Newcastle St., Brunswick, Ga. vii + 166 p., illus. 1953. $2.00. [From Texas Game and Fish 11(11).]

"This handbook of the fresh-water fishes of Texas is...written in semi-scientific language for use by students, sportsmen, and the professional fisheries worker. The book contains identification keys to the natural groupings of...190 species...Most of the species are illustrated with line drawings with an emphasis on the distinguishing characteristics. Also included are an abbreviated life history for each order or family and the range of each species."

INVERTEBRATES

Kaston, B. J. and Elizabeth. HOW TO KNOW THE SPIDERS. Wm. C. Brown Co., Dubuque, Iowa. 220 p., illus. 1953. Spiral binding, $2.25; cloth, $3.00. [From Nature Magazine 46(8).]

"This is the latest addition to the fine Pictured-Key Nature Series. It provides keys to identification and knowledge of the more common spiders and contains suggestions for collecting and studying them..."

Van Cleave, Harley J. ACANTHOCEPHALA OF NORTH AMERICAN MAMMALS. Illinois Biological Monographs 23(1-2): x + 179 p., illus. 1953. Price not stated.

A definitive work by the recognized authority. In addition to the taxonomic sections, there are chapters on preparation of specimens, morphology, general classification, habitat and host relationships, and faunal-history significance of the group.

Wharton, G. W., and H. S. Fuller. A MANUAL OF THE CHIGGERS. THE BIOLOGY, CLASSIFICATION, DISTRIBUTION, AND IMPORTANCE TO MAN OF THE LARVAE OF THE FAMILY TROMBICULIDAE (ACARINA). Entomological Society of Washington (c/o U. S. Nat. Mus.), Memoirs, no. 4. 185 p., illus. 1952. $6.00. [From review by C. D. Michener, Science 118(3062).]

"It contains sections on the public health importance of chiggers, behavior, life cycles and methods of culturing, anatomy, distribution, and ecology. There is a very extensive bibliography. The bulk of the book, however, is devoted to a catalog of the known chiggers of the world, with keys to the level of genera and subgenera."

VEGETATION--GENERAL, ECOLOGY, CONTROL, TECHNIQUES

Küchler, A. W. (U. Kans.) VEGETATION MAPPING IN EUROPE. Geographical Review 43(1): 91-97. Jan. 1953.

Vegetation mapping in Europe has become an important and highly refined branch of science, with elaborate techniques and classifications. This paper describes and compares the 4 major schools of thought, those of Braun-Blanquet, Gams, Schmid, and Gaussen.

Küchler, A. W. (U. Kans.) SOME USES OF VEGETATION MAPS. Ecology 34(3): 629-636. July 1953.

Detailed analytical vegetation maps now being prepared in Europe have many important, economical uses. These are discussed in some detail, and the introduction and application of such mapping in the U. S. are strongly recommended. Skillfully prepared vegetation maps are great time and money savers, not luxuries, as science and industry are urged to find out.

Moyle, John B., and Etlar L. Nielsen. (Minn. Dept. Cons.) FURTHER OBSERVATIONS ON FOREST INVASION AND SUCCESSION ON BASINS OF DRAINED LAKES IN NORTHERN MINNESOTA. American Midland Naturalist 50(2): 480-487, illus. Oct. 1953.

Stefferud, Alfred, editor. PLANT DISEASES / THE YEARBOOK OF AGRICULTURE / 1953. U. S. Department of Agriculture. xviii + 940 + 32 color pl. 1953. $2.50 from Superintendent of Documents.

The 147 papers in this volume cover their subject from discussion of causative organisms to concrete specifications for control. Introductory, general chapters constitute a sound, semitechnical text. Farmers and gardners will find chapters devoted to diseases of their own crops or flowers. Many chapters are devoted to fruit trees, nut trees, and berry bushes. One chapter is devoted to oak wilt and another to littleleaf in southeastern pines. Users of the book will be glad to find that pesticides are referred to by trade name as well as chemical name, a welcome departure from customary government policy.

VEGETATION--GENERAL, ECOLOGY, CONTROL, TECHNIQUES--Continued

Whittaker, R. H. (General Electric Co., Richland, Wash.) A CONSIDERATION OF CLIMAX THEORY: THE CLIMAX AS A POPULATION AND PATTERN. Ecological Monographs 23(1): 41-78, graph. Jan. 1953.
Detailed discussion, with 17-page bibliography. Concepts of various schools of thought are analyzed and "the climax pattern hypothesis" is presented as a substitute for the monoclimax and polyclimax theories.

VEGETATION--FLORAS AND COMMUNITIES

Bruggemann, P. F., and J. A. Calder. (Canadian Dept. Agric., Ottawa.) BOTANICAL INVESTIGATIONS IN NORTHEAST ELLESMERE ISLAND, 1951. Canadian Field-Naturalist 67(4): 157-174. Oct.-Dec. 1953.
Discussion of area and well annotated list.

Etter, Alfred G. WILDWOOD--A STUDY IN HISTORICAL ECOLOGY. Annals of the Missouri Botanical Garden 40(3): 227-258, illus. Sept. 1953.
"A 40-acre woodlot 12 miles northwest of St. Louis was studied for a year from a broad ecological point of view with the object of recording its history, flora, and fauna before it is subdivided." The woods were more than 50% shingle oak, black oak, and pignut hickory. Cows, fire, and fallen trees played major roles until, at last, the woods were destroyed by man.--Neil Hotchkiss.

Gambill, William G., Jr. THE LEGUMINOSAE OF ILLINOIS. Illinois Biological Monographs 22(4): xii + 117 p. 1953. Price not stated.
Taxonomic study with notes on habitat and Illinois and general distribution.

Hauser, Richard Scott. AN ECOLOGICAL ANALYSIS OF THE ISOLATED PRAIRIES OF NEWAYGO COUNTY, MICHIGAN. PhD thesis, Michigan State College. 179 p. 1953. [From Dissertation Abstracts 13(5).]

Lakela, Olga. (U. Minn. at Duluth.) A CHECK-LIST OF FERNS AND FLOWERING PLANTS OF THE QUETICO-SUPERIOR WILDERNESS RESEARCH CENTER. American Midland Naturalist 50(2): 488-500, illus. Oct. 1953.

Langenheim, Jean Harmon. DESCRIPTION OF THE PLANT COMMUNITIES AND ENVIRONMENTS OF THE CRESTED BUTTE AREA, GUNNISON COUNTY, COLORADO. PhD thesis, University of Minnesota. 223 p. 1953. [From Dissertation Abstracts 13(5).]

Laughlin, Kendall. (4114 W. Washington Blvd., Chicago, Ill.) A LIST OF THE TREES AND SHRUBS OF THE INDIANA DUNES STATE PARK. American Midland Naturalist 49(3): 904-907. May 1953.
Includes data on change (if any) in population status, and sizes of largest individuals.

Nelson, Ruth Ashton. PLANTS OF ROCKY MOUNTAIN NATIONAL PARK. Revised ed. U. S. National Park Service. x + 201 p., illus. 1953. $1.00 from Superintendent of Documents.
Grasses, sedges and species of a few other groups are merely listed, but keys and notes on recognition characters and habitats are provided for all common or conspicuous plants. There are also more than 100 photographs, a discussion of life zones, an illustrated glossary, and an index.

Oberlander, George T. THE TAXONOMY AND ECOLOGY OF THE FLORA OF THE SAN FRANCISCO WATERSHED RESERVE. PhD thesis, Stanford University. 192 p. 1953. [From Dissertation Abstracts 13(5).]
Stresses variability of succession, and discusses factors governing it.

Rubtzoff, Peter. (U. San Francisco.) A PHYTOGEOGRAPHICAL ANALYSIS OF THE PITKIN MARSH. Wasmann Journal of Biology 11(2): 129-219, illus. Summer 1953.
"The main object of the present work is to describe the flora of vascular plants of the Pitkin Marsh, which is located near Forestville, Sonoma County, California, and to give an analysis of the geographical affinities of the plants examined."

VEGETATION--FLORAS AND COMMUNITIES--Continued

Schaeffer, Robert L., Jr. THE VASCULAR FLORA OF NORTHAMPTON COUNTY, PENNSYLVANIA. University of Pennsylvania. 702 p., illus. 1949.
Has ample keys to all species and detailed notes on their habitats and distribution. About one hundred pages comprise accounts of botanical history, physiography, geology, climate, place names, floristics (both of native and introduced plants), bibliography, and index.--Neil Hotchkiss.

Stagner, Sylvia, compiler. CHECK LIST OF PLANTS OF SEQUOIA AND KINGS CANYON NATIONAL PARKS. Sequoia Natural History Association and Sequoia and Kings Canyon National Parks. 1-48 p. Mimeo. June 1951.
List with scientific and common names and indication of localities or habitats.

Strausbaugh, P. D. and Earl L. Core. FLORA OF WEST VIRGINIA (PART II). West Virginia University Bulletin Series 53, no. 12-1. 274-570 p., illus. June 1953. $1.00 from West Virginia University Bookstore, Morgantown, W. Va.
This volume describes dicots from lizard's-tail through legumes. As in Part I (see WR 73:79), keys and brief descriptions with adjacent drawings make it a complete and useful handbook.--Neil Hotchkiss.

Weber, William A. (U. Colo.) HANDBOOK OF PLANTS OF THE COLORADO FRONT RANGE. University of Colorado Press. vi + 232 p. 1953. $5.00.
As the subtitle indicates, this book consists of "Keys for the identification of the ferns, conifers, and flowering plants of the Central Rocky Mountains from Pikes Peak to Rocky Mountain National Park and from the plains to the Continental Divide." The keys are compact dichotomous in type and have been made as simple as accurate identification permits. Their use is facilitated by an illustrated glossary. Also important, they have been tested in class rooms. Common names and meanings of specific names are included, and the habitat of each species is indicated. The book should be of real value over much of the Central Rocky Mountain Region.

VEGETATION--FOREST

Baker, Harold L., and Adon Poli. AREA AND OWNERSHIP OF FOREST LAND IN SANTA CRUZ COUNTY, CALIFORNIA. U. S. Forest Service, California Forest and Range Experiment Station (Berkeley, Calif.), Forest Survey Release no. 21. 1-22 p., illus. Aug. 1953.

Banks, Wayne G. FOREST STATISTICS FOR CENTRAL MARYLAND. U. S. Dept. of Agriculture, Northeastern Forest Experiment Station, Forest Statistics Series: Maryland no. 2. 19 p., illus. 1953.
More than half of the total area of 7 counties is forested, and more than half of this is in commercial forest (oak, pine, yellow-poplar, sweetgum, bottomland hardwoods).--Neil Hotchkiss.

Buell, Murray F., and John E. Cantlon. (Rutgers U.) EFFECTS OF PRESCRIBED BURNING ON GROUND COVER IN THE NEW JERSEY PINE REGION. Ecology 34(3): 520-528, graphs. July 1953.

Cormack, R. G. H. (U. Alberta.) A SURVEY OF CONIFEROUS FOREST SUCCESSION IN THE EASTERN ROCKIES. Forestry Chronicle 29(3): 218-232, illus. Sept. 1953.

Daubenmire, R. (St. Coll. Wash.) NUTRIENT CONTENT OF LEAF LITTER OF TREES IN THE NORTHERN ROCKY MOUNTAINS. Ecology 34(4): 786-793. Oct. 1953.
Chemical analyses of freshly fallen leaves of 12 species. "Populus tremuloides, the only dicot studied, produces litter that is definitely superior in average quality to that of any of the conifers." Effect of various types of litter on soil pH is discussed. "The general conclusion reached by many earlier workers that the chemical composition of tree leaves is primarily a characteristic of the species is borne out by this study."

VEGETATION--FOREST--Continued

Division of Forest Economics. FOREST STATISTICS FOR NEW YORK FOREST DISTRICT NO. 3. U. S. Forest Service, Northeastern Forest Experiment Station (Upper Darby, Pa.), Forest Statistics Series: New York no. 3. 1-19 p. 1953.
This district includes 6 counties in central N. Y.

Hutchison, O. Keith, and Robert K. Winters. KENTUCKY'S FOREST RESOURCES AND INDUSTRIES. U. S. Forest Service, Forest Resource Report no. 7. iii + 56 p., illus. 1953. 35¢ from Superintendent of Documents.
A detailed report. In general, the forest is understocked and of poor quality. With protection and good management, present stands eventually could produce 2 or 3 times as much sawtimber.

Larsen, James A. (U. Wis.) A STUDY OF AN INVASION BY RED MAPLE OF AN OAK WOODS IN SOUTHERN WISCONSIN. American Midland Naturalist 49(3): 908-914, illus. May 1953.
Report of ecological study. "Red maple is found in oak forests of southern Wisconsin which have attained the stage prerequisite for transition to a maple-basswood climax forest. The conditions in the forest have only recently reached the stage where red maple will be able to compete with other species throughout the general forest area." Maple is already dominant locally. "It seems probable that red maple will continue a gradual spread throughout the forest."

Little, Elbert L., Jr. CHECK LIST OF NATIVE AND NATURALIZED TREES OF THE UNITED STATES (INCLUDING ALASKA). U. S. Forest Service, Agriculture Handbook no. 41. 472 p. 1953. $2.00 from Superintendent of Documents.
Covers all of North America north of Mexico, and includes species that may grow either as shrubs or trees. Species are listed alphabetically by scientific names; under each there is given the common name approved by the Forest Service, synonyms, meaning of scientific name, additional common names, and range. Toward the end of the book is a list of commercial names for lumber, a systematic list of families and genera (which is also an index), and an index of common names. This check list will be useful in bringing manuals up to date on matters of nomenclature, taxonomy, and ranges.--Neil Hotchkiss.

McCormack, James F. FOREST STATISTICS FOR THE SOUTHERN COASTAL PLAIN OF NORTH CAROLINA, 1952. U. S. Forest Service, Southeastern Forest Experiment Station (Asheville, N. C.), Forest Survey Release no. 41. ii + 45 p., illus. Sept. 1953.

Minnesota. THE FOREST RESOURCE OF HUBBARD COUNTY. Office of Iron Range Resources and Rehabilitation, 624 State Office Bldg., St. Paul 1, Minn. 1-63 p., illus. 1953.
Detailed report that discusses past and present conditions and makes recommendations for future. Other counties for which similar reports are available are: Crow Wing, Aitkin, Clearwater, Carlton, Cass, Itasca, Beltrami, and Wadena.

Moravets, F. L. FOREST STATISTICS FOR MASON COUNTY, WASHINGTON. U. S. Forest Service, Pacific Northwest Forest and Range Experiment Station (Portland 5, Ore.), Forest Survey Release no. 110. ii + 24 p., map. July 1953.

Moravets, F. L. FOREST STATISTICS FOR GRAYS HARBOR CO., WASHINGTON. U. S. Forest Service, Pacific Northwest Forest and Range Experiment Station (Portland, Ore.), Forest Survey Report no. 111. ii + 24 p., map and graphs. Aug. 1953.

Moravets, F. L. FOREST STATISTICS FOR LEWIS COUNTY, WASHINGTON. U. S. Forest Service, Pacific Northwest Forest and Range Experiment Station (Portland, Ore.), Forest Survey Report no. 112. ii + 24 p., map and graphs. Nov. 1953.

VEGETATION--FOREST--Continued

Moss, E. H. FOREST COMMUNITIES IN NORTHWESTERN ALBERTA. Canadian Journal of Botany 31(2): 212-252, illus. March 1953.
"Spruce, Tamarack (larch), balsam fir, pine, and poplar communities of the region are described in terms of floristic composition and ecological relationships." White spruce is regarded as climax. There are two black spruce communities and two pine communities (jack and lodgepole). "Natural succession of poplar and pine to white spruce is impeded chiefly by forest fires." Extensive tables show the species of the different communities, and their relative abundance in several different localities.--Neil Hotchkiss.

Parmelee, George Wynn. THE OAK UPLAND CONTINUUM IN SOUTHERN MICHIGAN. PhD thesis, Michigan State College. 297 p. 1953. [From Dissertation Abstracts 13(5).]

Shanks, Royal E. (U. Tenn.) FOREST COMPOSITION AND SPECIES ASSOCIATION IN THE BEECH-MAPLE FOREST REGION OF WESTERN OHIO. Ecology 34(3): 455-466, graphs. July 1953.

Tarrant, Robert F. SOIL MOISTURE AND THE DISTRIBUTION OF LODGEPOLE AND PONDEROSA PINE: A REVIEW OF THE LITERATURE. U. S. Forest Service, Pacific Northwest Forest and Range Experiment Station (Portland 5, Ore.), Research Paper no. 8. 1-10 p. Aug. 1953.
After reviewing the evidence, the author concludes that "All of the findings to date indicate that ponderosa pine is partial to well-drained sites and lodgepole is partial to more poorly drained sites."

VEGETATION--PASTURE AND RANGE

Cronemiller, Fred P. DEERBRUSH (SWEET BIRCH) IN CALIFORNIA. U. S. Forest Service, Region V. 1-16 p., illus. 1953.
Ecology and management of important range shrub.

Nielsen, Etlar L. (Div. Forage Crops and Diseases, USDA.) REVEGETATION OF ALKALI FLOOD PLAINS ADJOINING THE NORTH PLATTE RIVER, GARDEN COUNTY, NEBRASKA. American Midland Naturalist 49(3): 915-919, illus. May 1953.
Author's summary: "Distichlis stricta and Sporobolus airoides form the edaphic climax on the highly alkaline and phosphorus deficient soils adjoining the North Platte River in western Nebraska. Areas formerly under cultivation appear to have slightly higher pH values and lower available phosphorus than do virgin areas. Under the conditions that existed prior to the time these observations were made, it can be inferred that the edaphic climax species had become reasonably well established in from 20 to 30 years."

Pelton, John. (Oberlin Coll.) STUDIES ON THE LIFE-HISTORY OF SYMPHORICARPOS OCCIDENTALIS HOOK. IN MINNESOTA. Ecological Monographs 23(1): 17-39, illus. Jan. 1953.
Much information on ecology and biology of this shrub, which is important as a wildlife food, in erosion control, and as a weed.

VEGETATION--WET-LAND

Barske, Phil. EELGRASS. The Fisherman 4(11): 26, 48-49. Nov. 1953.
Reviews eelgrass demise of 1930 and discusses consequences to waterfowl, fisheries and bay bottoms. States that 99% of Atlantic Coast beds were destroyed in two years--the most severe disease in history of plant science. "...of the many known and unknown values of eelgrass, the one most important to the fisherman and to fish was the tremendous quantities of invertebrate life supported by the 'grass' beds: the worms, shrimp, scuds, snails--a whole host of tiny animal forms which fit into the fish's food chain." Reports that surviving beds were in areas of low salinity--locations cited. Recovery from disease has been mainly since 1942. Present status of plant at various points along Atlantic Coast is summarized.--A. C. Martin.

VEGETATION--WET-LAND--Continued

Nicholson, W. R., and R. D. Van Deusen. (516 Munsey Bldg., Balt. 2, Md.) VEGETATIVE TYPE MAPPING OF EASTERN SHORE AND ATLANTIC COASTAL MARSHES IN MARYLAND. Proc. NE. Section Wildlife Soc., 9th Annual Conf., Bretton Woods, N. H., Sept. 20-23, 1953. 1-6 p., maps.

Tells how Eastern Shore marshes were mapped and classified and gives figures on areas and distribution of the 6 marsh types used. These types are: cattail aquatic, 3-square cattail, 3-square, 3 square salt meadow-needle rush, needle rush-salt meadow, salt marsh. Data also are given on miles of shoreline and amount of open water.

Penfound, Wm. T. (U. Okla.) PLANT COMMUNITIES OF OKLAHOMA LAKES. Ecology 34(3): 561-583, illus. July 1953.

Study of natural and artificial lakes and their borders. Plant communities and physical factors affecting them are discussed. Fluctuating water levels make artificial lakes poor habitat for aquatic plants, and make establishment of waterfowl food plants difficult.

Silva, Herman. ALGAE OF THE TENNESSEE VALLEY REGION: A MANUAL FOR IDENTIFICATION OF SPECIES. PhD thesis, Michigan State College. 781 p. 1951. [From Dissertation Abstracts 13(5).]

Watson, Stanley W., and Erling J. Ordal. STUDIES ON LABYRINTHULA. University of Washington Oceanographic Laboratories (Seattle). Technical Report no. 3. (Reference no. 51-1.) 1-37 p., illus. Text by Duplicator, plates by offset. Jan. 1951.

Labyrinthula have been of interest to wildlife workers since 1935 when these aquatic micro-organisms were recognized as the cause of wasting disease in eelgrass (Zostera marina). This report touches only briefly on relationships of Labyrinthula to eelgrass. Instead it deals mainly with isolation in pure cultures, accomplished for the first time, and with morphology, movements and growth.--A. C. Martin.

LAND, SOILS, WATER, AND CLIMATE

Austin, M. E., and others. SOIL SURVEY OF STEWART COUNTY, TENNESSEE. U. S. Soil Conservation Service, Series 1942, no. 3. 1-224 p., illus. + large folding maps. Aug. 1953. $2.25 from Superintendent of Documents.

Boyd-Orr, Lord, and David Lubbock. THE WHITE MAN'S DILEMMA / FOOD AND THE FUTURE. George Allen and Unwin, London. 124 p. 1953. 9s. 6d. [From review in Nature 172(4374).]

Discussion of world food situation and what can be, should be, and is being done about it in various lands, and by international organizations. The author expects the world's population to reach 4,000 to 6,000 million and then decline. "The dilemma which he poses for the white man is the choice between attempting to maintain world military and economic supremacy, with the probable result of a disastrous world war which would end Western civilization, or using his present industrial superiority to develop the resources of the earth so as to end hunger and poverty, a course which would lead to the loss of the white man's world control gained by three centuries of conquest. As Lord Boyd-Orr says, this is a hard choice."

Carter, R. L., and Joel Giddens. SOILS OF GEORGIA; THEIR FORMATION, CLASSIFICATION AND MANAGEMENT. Agricultural Experiment Station (Athens, Ga.) Bulletin 52. 68 p., illus. 1953. [From Monthly Checklist of State Publications 44(5).]

Goldston, E. F., and William Gettys. SOIL SURVEY OF GRAHAM COUNTY, NORTH CAROLINA. U. S. Soil Conservation Service, Series 1942, no. 1. 1-81 p., illus. + large folding maps. Aug. 1953. $1.00 from Superintendent of Documents.

LAND, SOILS, WATER, AND CLIMATE--Continued

Hadlow, Leonard. CLIMATE, VEGETATION AND MAN. Philosophical Library, Inc., N. Y. 16, N. Y. 288 p., illus. 1953. $4.75. [From review by E. G. Dunford, Journal of Forestry 51(12).]

Written primarily as college text, but can be highly recommended for the average reader. "...the author deals with the influence of climate on peoples of the earth and on the plants and animals that make it possible for mankind to live... In developing his theme, the author dips into climatology, ecology, and economic geography. The result is an analysis directed toward the reader who is interested in a broad perspective of earth sciences." The book is divided into 3 main parts. Part I is "The foundations of climate." Part II is "Nature's response to climate--natural vegetation." This part is relatively brief and general. Part III, "Man's response to climate and vegetation," occupies half the book.

Matzek, B. L., and others. SOIL SURVEY OF SULLIVAN COUNTY, TENNESSEE. U. S. Soil Conservation Service, Series 1944, no. 2. 1-199 p., illus. + large folding maps. Sept. 1953.

Soil survey reports of this type contain much useful information on areas covered, and have exceptionally detailed, large-scale maps.

Odom, L. E. and others. SOIL SURVEY OF BENTON COUNTY, TENNESSEE. U. S. Soil Conservation Service, Series 1941, no. 6. 1-171 p., illus. + large folding maps. Aug. 1953.

Osborn, Fairfield. THE LIMITS OF THE EARTH. Little, Brown & Co., Boston. 238 p. 1953. $3.50. [From review by Russel Lord, The Land 12(3).]

This persuasive book presents clearly the consequences of the world's constantly increasing population, and traces the decline of productivity of many once-fertile areas. The author points out that the imbalance between populations and resources are the root of international troubles.

Poulson, E. N., and R. D. Flannery. SOIL SURVEY OF WHATCOM COUNTY, WASHINGTON. U. S. Soil Conservation Service, Series 1941, no. 7. 1-153 p., illus. + large folding maps. Aug. 1953.

Retzer, John L. (US Forest Service, Ft. Collins, Colo.) SOIL-VEGETATION SURVEYS OF WILDLANDS. Journal of Forestry 51(9): 615-619, maps. Sept. 1953.

Discusses values of such surveys in land management and tells how the surveys should be made.

Rosin, Jacob, and Max Eastman. THE ROAD TO ABUNDANCE. McGraw-Hill Book Co., N. Y. 166 p. 1953. $3.50. [From review by Jim Keefe, Missouri Conservationist 14(11).]

Tha authors, one a chemist and one a roving editor of Reader's Digest, maintain that the future will be a time of plenty and ease, with chemistry providing abundantly from materials now not used. "Freedom from the Plant will give us nutritive abundance and do away forever with agriculture and the need for fertile soil. Freedom from the Mine will take care of our other material wants. Such vanishing things as petroleum, steel, copper, zinc and the rest can just go ahead and vanish--they won't be missed. The chemist will have found substitutes." [Quotation from Keefe's review.]

Rothacher, Jack S. (TVA, Norris.) WHITE HOLLOW WATERSHED MANAGEMENT: 15 YEARS OF PROGRESS IN CHARACTER OF FOREST, RUNOFF, AND STREAMFLOW. Journal of Forestry 51(10): 731-738, illus. Oct. 1953.

"Fifteen years of protection and reforestation have so improved the forest cover of 1,715-acre White Hollow watershed in eastern Tennessee that the summer peak flows have been reduced 73 to 92 percent; the duration of summer storm runoff has been prolonged up to 500 percent. A more sustained flow has resulted without any material change in total water yield. The original forest cover has increased in volume from 4,444,000 to 7,104,000 board feet. Natural and planted stands have so controlled erosion on open lands that White Creek now maintains a flow of clear water suitable for rearing trout."

LAND, SOILS, WATER, AND CLIMATE--Continued

Rudolph, Foster, and others. SOIL SURVEY OF THE NORRIS AREA, TENNESSEE. U. S. Soil Conservation Service, Series 1939, no. 19. 1-173 p., illus. + large folding maps. Aug. 1953. $2.00 from Superintendent of Documents.

Shrader, W. D., and others. SOIL SURVEY OF HOLT COUNTY, MISSOURI. U. S. Soil Conservation Service, Series 1939, no. 21. 1-61 p., illus. + large folding map. Dec. 1953. 60¢ from Superintendent of Documents.

Veatch, J. O. SOILS AND LAND OF MICHIGAN. Michigan State College Press, Memoir 7 of Mich. Agric. Exper. Sta. 240 p., illus. 1953. $7.50. [From review by John L. Arend, Journal of Forestry 51(11).]
Describes physical features, soils, types of tree vegetation, and land types. Discusses land use history, problems, and policies.

Veihmeyer, F. J. HYDROLOGY OF RANGE LANDS AS AFFECTED BY THE PRESENCE OR ABSENCE OF BRUSH VEGETATION. Association Internationale d'Hydrologie, Assemblée Générale, Brussels, Belgium. Vol. 3: 226-234. 1951. $1.00. [From Journal of Forestry 51(9).]

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